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IRON AGE

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THE IRON AGE
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DIGEST

of the week in metalworking

HEWING OUT IRON ORE MINES OF FUTURE

PAGE 37
Hard work at the crucial jobs of opening up new iron ore mines to feed America's steel industry is pushing the projects to on-schedule completion. All's well at mine work at Quebec-Labrador. U. S. Steel will soon sign the river contract with Venezuela. Bethlehem ore imports will rise high.

TRAIL TO AUTO FORGING INGOTS IS ROCKY

PAGE 39
Steel conversion experience earned the hard way serves auto industry purchasing agents well today. The steel sleuths are tracking down high carbon or alloy ingots for forging. It takes most of their time, they admit. Automakers are getting by but trouble in this market could hit swiftly.

STEEL UNION LEADERS GO TO COLLEGE

PAGE 40
College level training courses dealing with labor's role in government and the usual problems of human relations in unions are making steel union leaders a lot smarter than they were in the early days of the United Steelworkers of America. The union's program is on a coast-to-coast basis.

SURPLUS STAINLESS FOR CIVILIAN USERS

PAGE 42
A revision of the military's fourth quarter stainless steel requirements has resulted in a windfall for civilian users. DPA last week released an additional 10,165 tons for civilian use. This was good news to automakers and manufacturers of consumer durables, easing substitution problems.

ONE COAT OF ENAMEL ON PLAIN STEEL

PAGE 43
The porcelain enameling industry has passed a milestone with a new process developed by the Strong Mfg. Co. It puts one coat of white titanium enamel directly on non-premium steel without a ground coat. The process is called Ti-Lock. The coated steel can be drilled, sawed, or punched.

HARVEY DENIES COAST POWER SHORTAGE

PAGE 67
Harvey Machine Co. said there was nothing to the report that their Kalispell, Mont., aluminum reduction plant would not be built because of the shortage of electric power. Power for the plant was to come from the Hungry Horse Dam—when completed. Politics, finance are seen the culprits.

BEHIND THE SCENES OF THE TOOL SHORTAGE

PAGE 71
The postwar period was the breeding ground for machine tool shortages striking hard now. Add to this, Washington stalling tactics and lack of sympathy for builders' problems and the result is trouble today. The tool industry was in a business slump before Korea. Prices were low, workers lost.

IMPACT EXTRUDE MAGNESIUM SUCCESSFULLY

PAGE 81
Magnesium is being successfully impact extruded by Dow Chemical Co. Present use is mainly for dry cell cases, but many other uses are expected to be found. Light, rigid, oil and chemical resistant magnesium can be impact extruded in round, oblong, or rectangular shapes with ribs, flanges.

TEMPERED MARTENSITE BRITTLINESS DEFINED

PAGE 86
"Blue brittleness" pertains to low alloy ferrite and it should not be confused with "temper brittleness." Three new designations are proposed to eliminate confusion in present terminology. Third factor not yet simply defined might better be known as "hard tempered martensite brittleness."

5 MILLION LB ALUMINUM RECOVERED YEARLY

PAGE 94
The scrap system at Chrysler yields a net profit—and provides 57½ pct of the aluminum used in pistons. Even extremely fine chips are reclaimed and the furnace dross is reworked. Since the recovery operation is not run continuously, only the part-time work of fifteen men is required.

STEEL USERS SLOW TO CANCEL ORDERS

PAGE 117
Steel consumers aren't rushing to cancel their orders, even though NPA says they must. Recent cutbacks should cause some cancellations, but instead of cancelling at once consumers are letting the orders ride until they've had a chance to appeal in Washington. Thus imbalance still holds.

THE IRON AGE PREVIEWS WORLD METAL MEET

NEXT WEEK
Complete programs, exhibitors for the Metal Show will be given, along with special features such as complete nonferrous alloy specifications, survey of armed services' aluminum needs, report on forging and rolling of nodular iron and a chart listing comparable arc-welding electrodes.

• BAKER-RAULANG COMPANY, says:

a Cincinnati Shear brought these results



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| 1 | lower costs |
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| 3 | steady stock supply |
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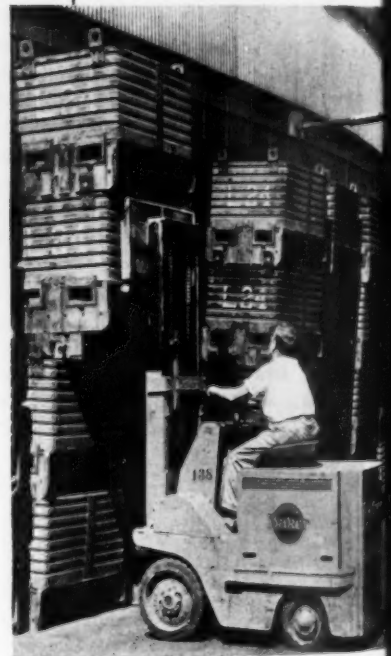
With the installation of this Cincinnati Shear, a do-it-yourself program replaced dependence on outside sources at the Baker-Raulang Company, manufacturers of industrial trucks.

Sheets of any required size are now sheared without delay and are always ready for assembly when needed. This results in a smoother, controlled manufacturing schedule, reduced inventory and, at the same time, improved deliveries.

The accurate performance of Cincinnati Shears reduces shearing costs—savings in subsequent fabricating operations result from better fits.

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Photos courtesy Baker-Raulang Company, Cleveland, Ohio



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The Military Is Not Sacred

BOTH houses of Congress have passed a military appropriation which has no parallel in our history—except for a short period in World War II. When the kinks are ironed out in conference the bill will come close to \$60 billion.

Congressmen of both parties know the danger the free world faces. They know the cost of unpreparedness. They also know what type of enemy we may have to face in battle unless we arm for peace.

They did not shrink from passing the record peacetime military bill. They know what such an outlay will do to the country's economy. The people know this too.

The people also want to be sure that such a price for peace will not hide slipshod accounting, cockeyed figures, too much guess work and lack of common sense.

The people believe that the military and Congress know what they are doing. But \$60 billion is such a fantastic figure that no one person or group can grasp its significance.

There are many who are beginning to believe that our government and the military have "billionitis"; that in dealing with such figures it is easy to say "What's another billion or two with such a total?"

There is a "smart" idea in some circles that to question military figures is playing a communistic game. That's stupid. We should question any budget as great as the one just passed. No one should be called a Red because he or she asks questions.

We are still a democracy. If the time comes when the military or its supporters can frown away criticism by suggesting that the critic may not be quite 100 pct American, we had better give the country over to the Russians without a fight.

Any budget—military or otherwise—should always be questioned. If there is room to cut on a common sense basis it should be done.

Let's not just fling our money away without getting full value. The military is not sacred. It is just as liable to criticism as is Congress, the President or anyone else in the employ of the people.

Tom Campbell

Editor



SUNTAC ENDS LUBRICATION HEADACHE

**Keeps Plant in Full Operation
and Reduces Oil Consumption 50%**

Cold-rolling threads on cold-headed bolts is a tough operation, and a mighty big financial headache, if the thread-roller does not receive proper lubrication.

Such a condition developed in the plant of a well-known manufacturer of screw machine products. Oil ran out of bearings and would not adhere to the guides for the reciprocating die holder. On several occasions the main bearings overheated and seized up. In each instance four days' downtime re-

sulted, costing a large amount for labor and 30 percent in bolt production. Furthermore, the oil loss became so excessive that maintenance crews actually had to put in extra work to keep floors clean and safe.

In his search for a solution to the problem, this manufacturer called in a Sun representative, who induced him to try Suntac Oil. In the 18 months which have elapsed, there have been no production losses attributable to inadequate lubrication, downtime has been

eliminated, and cleanups have been reduced to a routine minimum. The consumption of oil has been cut in half. Savings on oil and maintenance have amounted to more than \$3,000.

Suntac Oils are recommended for general lubrication in all machinery where retention of oil in bearings is a problem. These "Job Proved" products cling to the parts to be lubricated. For further information, call or write your nearest Sun Office.

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Dear Editor:

Letters from readers

The Good Word

Sir:

Your editorial "The Good Word" of Sept. 6 is a masterpiece!

I have often heard it said and seen it written many times but never, it seems to me, so humble and inoffensive yet so impressive. Congratulations!

From my impressions from many lectures—question periods—it is my considered judgment that not 50 pct of executives and foremen even say "Good Morning" to those from whom they expect so much.

Yet, from private interviews it is invariably disclosed that every man has it within himself to be friendly and appreciative. He has just never been trained to let it out as techniques have taken up his cultural time. Humanity is indeed inarticulate in building relationships.

Every man in charge of personnel in industry should have enough copies of that editorial to send to everyone of his executives and foremen. I could use 1000.

Why wouldn't it be money well spent to reprint it and send it out?

Thank you so much for your worthwhile contribution.

W. S. BARLOW

Woodbury, Conn.

People v. Themselves

Sir:

I have read your editorial "People Against Themselves" in the Aug. 30 issue and wish to go on record as heartily concurring with your convictions.

C. WEINGARTEN
President

Beacon Enterprises, Inc.
Yonkers, N. Y.

Automatic Dipper

Sir:

Have you more detailed information on the item about automatic bright dipping that appeared on the Newsfront page of your Sept. 6 issue?

I. W. MARCOVITCH
Plant Chemist

U. S. Gauge Div.
American Machine & Metals, Inc.
Sellersville, Pa.

The automatic bright dipping machine is installed at the Bastion-Blessing Co., Chicago. It was developed by them in collaboration with the F. G. Stevens Co. of Detroit, who built the machine.—Ed.

Permanent Record

Sir:

We were quite interested in the article "Corrosion Proof Cement Extends Pickling Tank Life" which appeared in your Aug. 23 issue.

We would like to pass this information

along, as a permanent record, to some of our subordinates, so we would appreciate it if you could send us three reprints of the article.

T. A. SPILLETT
Superintendent—Wire Dept.
Crucible Steel Co. of America
Syracuse, N. Y.

New Hydrocarbon

Sir:

We refer to the item on p. 11 of your Sept. 6 issue on a new compounded hydrocarbon and special nozzle. Can you furnish us with more information on the process and supplier.

F. R. BAYSINGER
Welding Engineer
American Locomotive Co.
Dunkirk, N. Y.

Additional information can be obtained from Bert P. Ross, president, Acetogen Fabricators, Inc., 822 Commercial Trust Bldg., Philadelphia 2, Pa.—Ed.

Subcontracting Exhibit

Sir:

In reference to the Sept. 13 issue, on p. 113 we noticed an article concerning a prime contractor's exhibit for small businessmen in the Michigan area.

We are interested in such displays but we find that Michigan is too far to travel. We would be deeply grateful to you if you would inform us of any such displays in the New York area.

V. BRAUNSTEIN
Achilles Construction Co., Inc.
Brooklyn, N. Y.

These exhibits are scheduled by the Army, Navy and Air Force with approval from the Munitions Board. The Patterson, N. J. Chamber of Commerce has one scheduled for Oct. 3-5.—Ed.

Iron Powder Potential

Sir:

In your Aug. 30 issue you mention the expansion potential of the iron powder industry. We would appreciate it if you could send us a list of publications outlining the various manufacturing processes employed by this industry, particularly if there has been anything written about the production of iron powder, using scrap as the raw material.

P. PADEN
Compressed Steel Co., Inc.
Denver

Nothing detailed enough on the production of iron powder has been published in business papers. However, we may be publishing a rather comprehensive story in the not-to-distant future. In the meantime a list of books has been sent.—Ed.

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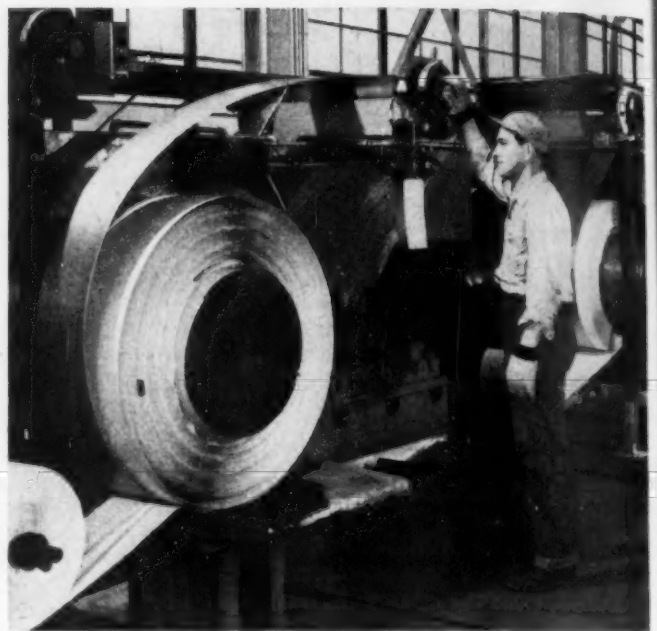
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Headquarters for ELECTRICAL ADJUSTABLE-SPEED DRIVES

GENERAL ELECTRIC

Fatigue Cracks

By Charles T. Post

Ham Economy

For the second time in a month, hams—the kind you eat—broke into the news last week. One of the former RFC officials accused of favoritism in doling out dollars—there are so many officials and dollars involved that we forget names and amounts—admitted that a loan applicant had sent him a ham. A senator asked the official how elastic his ethics were in accepting hams. The official replied that as long as the ham was under 12 lb his conscience was clear.

Just as we were bringing our moral code up to date on his basis (12 lb hams—OK; 12½ lb hams—NG. Fifth of bourbon—OK; Quart—NG. Ranch mink coat—OK; Royal pastel mink—NG), we heard from Charles Weingarten of Beacon Enterprises, Inc. He enclosed a treasured clipping which stated that a CIO packinghouse union out in Iowa had demanded, as part of its contract, a 15 lb ham for each employee for Christmas and Easter.

Taken together, these two incidents clearly demonstrate how the standards of the American people have deteriorated. Couple of years ago no self-respecting government official or union man would have settled for anything less than steak or roast beef. Now it's ham, and a year from now you may be able to keep 'em happy with a couple of cans of corned beef hash. No. 2 cans, that is, unless you want to get investigated.

Alchemy

"The NPA also prohibited passenger car manufacturers from using engine pistons made of primary or new aluminum. Pistons may be made of secondary aluminum—that is remelted from scrap or cast iron." Associated Press news item, Boston Post, Sept. 12.

This startling advance in modern alchemy was called to our attention by Joe Wood of Jones & Lamson Machine Co., which undoubtedly is frantically reappraising all of its products in a new light. Just think, every gray iron foundry an airplane factory. Every scrap yard, an Alcoa competitor. Bet the Russians won't claim they thought of THAT first. Or perhaps they will.

Apronym

The other day your f. f. j.'s Miss Roberts called up the McCarthy Foundry Co., Chicago. "Miss Gray speaking," said a pleasant voice on the other end of the line. "What kind of castings does your firm make?" Miss R. wanted to know. "Gray iron castings," said the voice. How can you cope with it?

And then there was the man who walked into the personnel office of Kaiser Aluminum & Chemical Corp., Spokane, looking for a job. "Name please?" said the girl at the desk. "Henry J. Kaiser," said the athletic looking applicant, obviously in his mid-forties. "Strange coincidence. What's the middle name?" asked the personnel clerk. "John," said the job seeker, "and I'm a top-notch draftsman."

And that's how it happens that Henry John Kaiser is working for Henry John Kaiser, no relation. We can't wait for the day that the accounting department gets the salary checks mixed up.

Puzzlers

The answer to last week's puzzler would more than fill this column if we attempted to print it in full. F. Rondepierre, Renault Selling Branch Inc., delivered his answer to us on the day the issue came out and thereby became the first man that we know of to be mentioned in the following week's issue. He got them all down from the tower in 11 moves. Has any one done any better?

H. L. Ludwig, U. S. Steel Export Co., the originator of the frog problem, accepted J. A. Davenport's challenge and sent us his answers to the second frog problem. So did L. J. Gierosky, Cleveland. R. W. Huff, Canton, O., and H. S. Blackstone, Ropp & Blackstone, determined the width of the corridor in the steel mill problem with no difficulty at all.

R. F. Perkins, Rumford, R. I., says that this problem nearly stopped the Quiz Kids. The problem is this—To prove equilateral the triangle formed by the apexes of 30° isosceles triangles erected on the 3 sides of any triangle and perpendicular to the plane of the triangle.

WHAT METALS
DO YOU CLEAN?

Some good things
to know about
Metal Cleaning

Which
soils are
hardest to
remove?

- ☐ buffing compound residues
- ☐ pigmented drawing compounds
- ☐ oils and greases
- ☐ heat scale
- ☐ tarnish
- ☐ rust, oxides
- ☐ carbon smuts
- ☐ flux residues
- ☐ rust preventives

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Tell me about Oakite methods for removing the following soils:

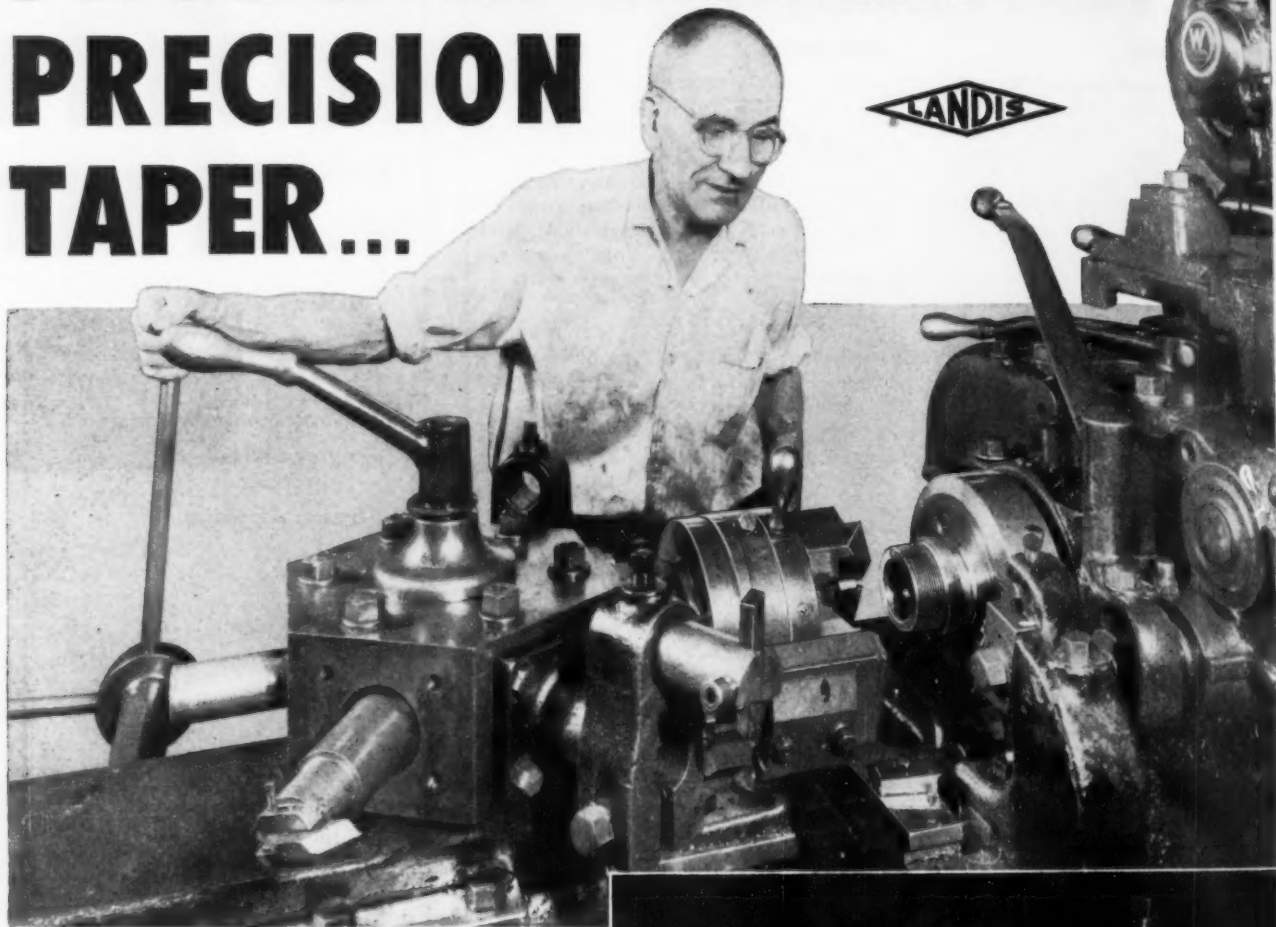
- ☐ ALSO send me a FREE copy of your booklet "Some good things to know about Metal Cleaning".

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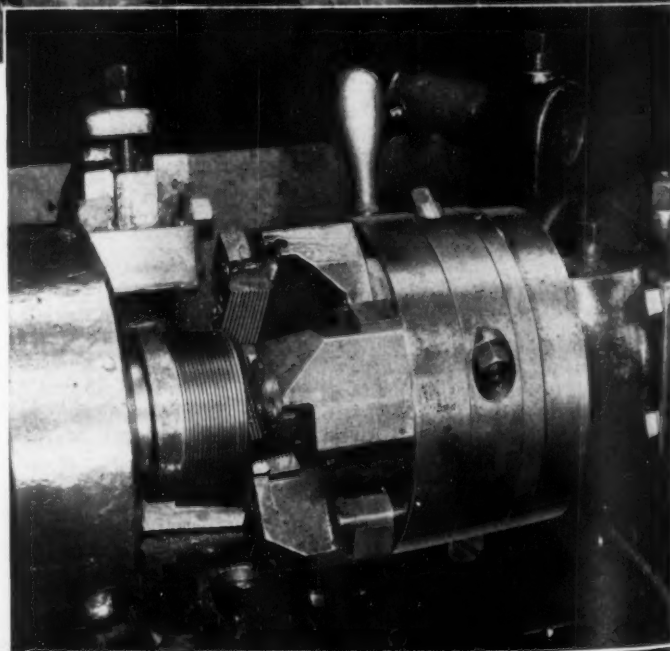
LANDMATIC DIE HEAD PRODUCES THREAD *with* PRECISION TAPER...



The 2" LANDMATIC Die Head with Taper Attachment illustrated is designed for cutting tapered threads where precision and thread finish are of prime importance.

The mechanically-controlled operation of the taper attachment causes the chasers to expand on diameter as the work enters the die head. Thus, cutting strains normally encountered in producing tapered threads are minimized. This results in finer thread finish, greatly improved accuracy, and materially longer chaser life.

The value of the taper attachment is particularly apparent when cutting threads with high taper or of lengths greater than those ordinarily used for standard pipe threads. Write for Bulletin F-90.



**LANDIS *Machine* COMPANY • WAYNESBORO
PENNSYLVANIA**

THE IRON AGE Newsfront

► Some companies making armament goods are thinking in terms of shortages too. One tank plant is preparing for possible shortages by redesign studies—though no changes are necessary now. The same plant is also making life a little easier for others by cutting back on spare parts orders for bearings.

► A way has been found to make Neoprene more adhesive. This will fit it for heavy duty industrial uses where its oil resistance is important. Up to now heavy pressures tended to separate the rubber-fabric layers. It has already worked out well in pile-driver hose—a tough application. The product is not yet on the market.

► Time-consuming hand gaging methods of checking sheet steel thickness in mixed lots in consumer shops are being eliminated by an automatic X-ray machine apparently similar in principle to the technique used on continuous strip steel mills.

► Some elements of the military have apparently been scared—perhaps too much so—by the watchdogs of the public purse. The Air Force is buying big forging hammers for jet engine bucket wheels. One supplier said he could shorten delivery by 7 months if 5-pct more expensive (but more available) material were substituted on some hammer parts. The reply was an emphatic "No!"

► The head of a large steel company is getting ready to prove how big business helps little business. He is working up the figures on a case history that will be an eye-opener on the interdependence of big and little business.

► The Quartermaster Corps has developed armored clothing to protect troops against low velocity shell fragments. Soon to be field tested is a new plastic helmet of laminated nylon under an aluminum shell. It gives better protection than the present steel helmet and is more likely to be worn. Also, there is body armor consisting of a cotton jacket with front and back panels of laminated glass fiber and plastic that will stop a .45 caliber bullet.

► Aluminum panels weighing 300 lb have been designed to close 54 street openings in the floodwall at Louisville, Ky. Their light weight permits closing a 24-ft opening in an hour.

► Within a few weeks U. S. Steel is expected to sign a river dredging contract with the Venezuelan government. This will be the signal for the start of iron ore mining and handling facilities construction at full steam. All engineering has been completed and successful bidders have their letters of intent.

► Political dynamite is slowing government loans. At least two large projects for basic metal expansion are held up because they are vulnerable to charges of favoritism. Mink coat type scandals will cause government officials to take a third look before approving projects.

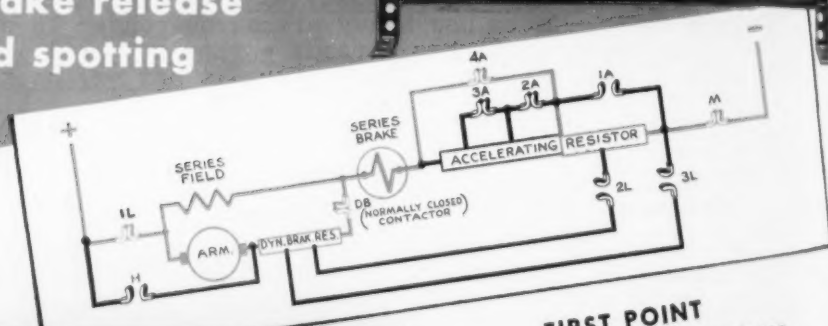
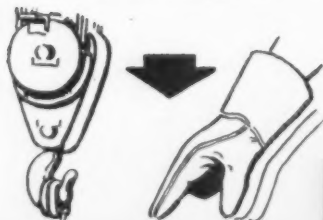
► General Eisenhower's request for a 33 pct increase in European military production in 1952 is the first revelation of what U. S. officials have felt for some months but have been afraid to talk about for fear Europe would consider the rearmament job hopeless.

8
Important
Features of
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Magnetic
Control

- 1 Time-Current Acceleration
- 2 Line-Arc Contactors
- 3 Wright Hoist Circuit ✓
- 4 Tab-Weld Resistors
- 5 Cam Master Switches
- 6 Safer Electrical Interlocks
- 7 Bolted, Welded Frame
- 8 Quick Contact Renewing

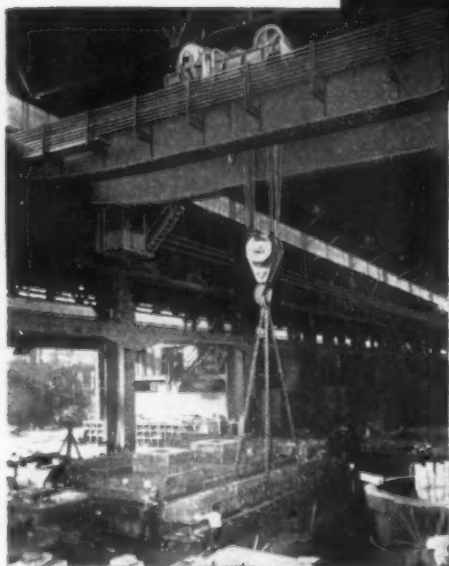
THE WRIGHT DYNAMIC LOWERING CIRCUIT FOR CRANE HOISTS

1. gives fast brake release
2. accurate load spotting



FIRST POINT
LOWERING CONNECTIONS

Where good inching means
fewer movements—
reduced wear



The EC&M Wright Circuit for Crane Hoists is well-known for its ability to spot a heavy load accurately.

Look at the diagram of the first point lowering connections. Note the line in red showing that all the current taken from the line goes through the brake coil for fast brake release. Combined with fast operating LINE-ARC Contactors, the loaded crane-hook can be inched down with ease. A heavy load is carefully landed—with a minimum number of movements which maintenance men recognize as a contributing factor to reduced up-keep and wear.

When buying cranes, specify EC&M Magnetic Control.



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IRON ORE: Future Supply Looks Bright

All's well at Quebec-Labrador . . . Ore by '54 . . . U. S. Steel soon to sign river contract with Venezuela . . . Bethlehem ore imports may hit 2 million tons in year—By Tom Campbell.

Less than 3 years ago Quebec-Labrador and Venezuela iron ore discoveries caused hardly a ripple in the steel trade. Those who knew about them were hot with excitement but their stories caused many raised eyebrows and much head shaking.

Then this country was faced with a dangerous shortage of high-grade, open-pit iron ore. Quietly those who knew how serious it had been were hard at work—looking for ore. Today all this is changed. Everyone talks like an expert now on these iron ore discoveries.

All's Well—This week work is well along at Iron Ore Co. of Canada's project in upper Quebec. Things are ready to go in a flash at U. S. Steel's Venezuela plum. Bethlehem Steel is "routine" on her ore from Venezuela.

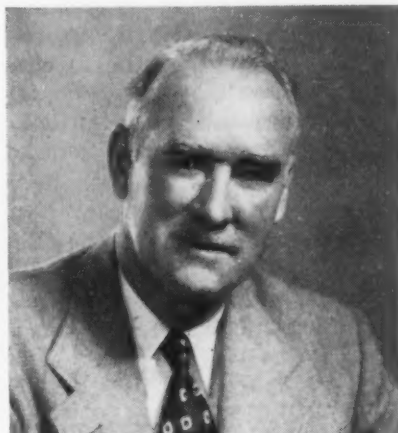
Construction engineers who build, curse, wheedle, beg, borrow, yell, weep and work hard on job sites are a happy crew. But when they are chained to a desk they make up for this confinement by being super-impatient slave drivers. Bill Durrell, manager of the Iron Ore Co. of Canada project, is like this—so things are on schedule.

Out of 360 miles of railroad to be built, more than 125 miles have been graded—thanks to using air for shipping large pieces of building and grading equipment.

Ore Lifeline—The big bridge across the Moisie River, 12 miles from Seven Islands, Quebec, being built now, will be finished this

December—with some kind of a record established. This is a main artery for ore trains up the Moisie valley terrain.

During railroad construction, work has been done at the ore body at Burnt Creek—320 air miles from Seven Islands and about 1100 air miles north of New



BILL DURRELL . . . Off to a good start

York. There, detailed drilling for pit layouts and structure research—the basis for the future mining operations—has been under way.

As things look this week, iron ore will be coming from Burnt Creek by late summer or early fall of 1954. Whether ore will leave Seven Islands in 1954 for American steel mills is still a guess but the stockpiles at Seven Islands will be started by then.

For full details on Quebec-Labrador iron ore see THE IRON AGE, Nov. 4, 1948, p. 155; Oct. 19, 1950, p. 93; Feb. 8, 1951, p. 83. For Venezuelan ore see THE IRON AGE, Dec. 30, 1948, p. 71; Mar. 3, 1949, p. 149; Apr. 20, 1950, p. 107.

Two Billion Tons—Close to 500 million tons have been proven and there are probably close to 2 billion tons in the field. The average iron content is around 60 pct (dry) and there will be vast tonnages of manganiferous ores with about 8 pct manganese.

Mining engineers are about as zaney and wild and as happy as construction engineers on the job. Chain them to a desk and they, too, are hard to get along with. Restrained energy finds its



MACK LAKE . . . Raring to go

outlet in trying to single-handedly build railroads, mine ore and become super-diplomats.

Such is Mack C. Lake, Orinoco Mining Co. head and group leader—or needler—behind U. S. Steel's Venezuelan ore venture.

In a few weeks or so, U. S. Steel and the Venezuelan government will sign a contract covering dredging of the Orinoco River for ore transportation to the sea. U. S. Steel will do the river work; the government will collect river tolls on shipments.

Happy Together—The relationship between U. S. Steel and the Venezuelan government is good. No government could have given

TACONITE: Commercial Use Near

Reserve Mining lets contract for commercial beneficiation plant . . . Erie Mining Co. and Oliver Iron Mining Co. hot on their heels . . . Taconite reserves measure billions of tons.

The long, painful years of expensive research on beneficiation of taconite ore are about ready to begin paying off. Reserve Mining Co. has awarded construction contracts for a \$75 million iron ore beneficiation plant at Beaver Bay, Minn.

Thus, Republic Steel Corp., Armco Steel Corp., and National Steel Corp., owners of Reserve Mining, have jumped into the lead in the race for commercial exploitation of vast domestic taconite reserves still untapped.

Competitive Price—Taconite is hard, ore-bearing rock. Iron content runs about 25 pct. Domestic reserves are estimated in billions of tons. But commercial exploitation has not been possible because of the high cost of freeing and separating the iron from the rock.

Now Reserve Mining believes it will be able to produce beneficiated taconite ore at a cost com-

petitive with other Lake Superior ores. They estimate their 10,000-acre holding contains 1.5 billion tons of taconite which should yield 500 million tons of 64 pct iron.

Method Used—Reserve's plant, scheduled for completion in 1955, will be capable of turning out 2.5 million tons of concentrated pellets annually. Facilities are planned so that capacity can later be enlarged to 10 million tons.

They process magnetic taconite like this: (1) Iron bearing rock (about 25 pct Fe) is crushed and ground fine; (2) iron is removed by magnetic separation; (3) concentrated iron (now about 64 pct) is rolled into walnut-sized pellets; and (4) pellets are baked to make them hard.

Experience—Back of the Reserve Mining operation is Republic Steel's extensive experience with beneficiation of lean mag-

netic iron ores at its Adirondack mines. Their experience in grinding and separation is being added to all that Reserve has learned from pilot operations.

Results of these pilot operations have been much better than is generally known. Trial use of pelletized iron ore concentrates was made in the Armco blast furnace.

Close Race—Hot on Reserve's heels in the taconite race are Erie Mining Co. and Oliver Iron Mining Co.

Erie, owned jointly by Bethlehem Steel Corp., Youngstown Sheet & Tube Co., Interlake Iron Corp., and Pickands Mather Co., is also nearing the production plant stage at Aurora, Minn. This plant may produce 2.5 million tons of beneficiated ore per year. Pilot operations have been going on nearly 3 years. And Bethlehem has gained valuable experience in Cornwall, Pa., mines, where ores have been concentrated, pelletized and sintered.

U. S. Steel enters the picture through its subsidiary, Oliver Iron Mining Co. At Mountain Iron, Minn., Oliver is building a pilot plant to produce 500,000 tons of finished concentrates per year.

Special Report

Continued

more cooperation to a private company—from outside its borders. This goes for Bethlehem and Venezuela, too. Without it the United States would not now be in a position to obtain much-needed ores by 1955.

When the U. S. Steel-Venezuelan river contract is signed, actual construction will begin. Engineering has been completed. Successful bidders have their letters of intent. As things look this week, ore will be moving in 2½ to 3 years from the day the crews start construction. It means ore coming to U. S. Steel plants about the end of 1954 or early 1955.

Contractors on the U. S. Steel project are: Bechtel International

Corp., general contractors; Morris & Knudsen Co., railroad and highway; Raymond Concrete Pile Co., dock; Cahagan Overseas Construction Corp. and McWilliams Dredging Co., river dredging. All of these contractors are ready to go at a moment's notice.

Another 2 Billion—Iron content of Orinoco Co. ore is around 63½ pct (dry). A rough guess on potential of U. S. Steel properties is 2 billion or more tons. More than 500 million tons have been proved at Cerro Bolivar but that is only part of the concession.

Shipment from Quebec-Labrador will eventually reach 15 million tons a year, with most go-

ing to U. S. steel mills. Shipments from U. S. Steel's Venezuelan concessions will eventually be 15 million ton a year rate. Bethlehem ore from Venezuela will hit a 2 million ton a year rate in a year or so.

America's iron ore production in 1950 was 98 million tons. (It will exceed 110 million tons this year.) Of this, 80 million came from the Lake Superior region. Mesabi ore output consistently accounts for 73 pct to 75 pct of Lake Superior ores. That ore body is diminishing rapidly, so help from Canada and Venezuela, coupled with taconite output will extend Mesabi's life considerably.

FORGING: Trail to Ingots is Rocky

Detroit steel hunter's conversion experience helps . . . Obstacles more treacherous . . . Not many except big mills can make special type of high grade ingots—By Walter Patton.

Steel conversion experience earned the hard way by Detroit purchasing agents is serving the auto industry well in today's austerity market. The steel sleuths are tracking down high carbon or alloy ingots for forging. Obstacles are many and growing more treacherous.

Star shortage billing in steel products has been taken away from flat-rolled sheets by carbon and alloy bars and forging stock.

Narrow Margin—At the present reduced auto production rate, the industry is getting by in procurement of ingots to be hammered down into billets for crankshafts, axles, steering knuckles, steering arms, and other highly stressed parts. But the forging margin of safety, even with cutbacks, is very narrow and the industry may be forced out into the danger zone at any time.

Local steel buyers admit most of their time is spent trying to line up high-quality forging steel.

Ingots Scarce—The problem of finding forging grades of steel, even in ingot form rather than preferred billet form, is difficult. Ingots must be poured in hot tops and thoroughly killed to give fine grain. The steel must also be slow cooled.

This limits the number of sources outside the big mills that have either the facilities or necessary know-how. Sometimes hot top melting experience is lacking. Again, furnace facilities may be inadequate to provide the long slow cooling cycle that is so essential.

Even major steel producers are shying away from taking on any additional production of forging ingots, according to Detroit steel buyers. This is true even where the buyer offers to take the steel

to another plant for reduction into forging billets.

Feed-Back—Most auto producers admit they have found it necessary to feed back many tons of billets to their source of crankshafts and axles. Because of recent cutbacks in steel allotments, big crankshaft suppliers, for example, would have fallen far behind in their deliveries to Detroit if the auto makers had not stepped in and supplied the steel that was cut off under government allotments and diverted to other steel users.

Downgrading—In addition to reduced tonnages of forging grades the auto producers and their suppliers are being caught by downgrading. Under orders from Washington, certain types of alloy steel may not be used for certain applications. Thus, a buyer who specified SAE 6145 may find it necessary to downgrade to SAE 8600 or even to a boron steel. In some instances, the steel may already be made and in the pro-

ducer's hand. Nevertheless, it cannot be used for the job. The consumer has to wait for the steel permitted for that application.

A substantial tonnage of steel that was originally ordered for jobs but is now downgraded is piling up in users' yards. Special permission from Washington will be required to break the steel loose. In the meantime, a permissible grade may be on the mill schedules, adding to the crowded demand that is already too great for the steel capacity available.

No Relief—It now appears that the auto industry will be permitted to make about 1 million passenger cars during each of the next two quarters. Even at this reduced rate, billets and bar steel for forgings promise to be very tight. If any relief is in sight, nobody in Detroit seems to know where it will come from.

Container Conservation Growing

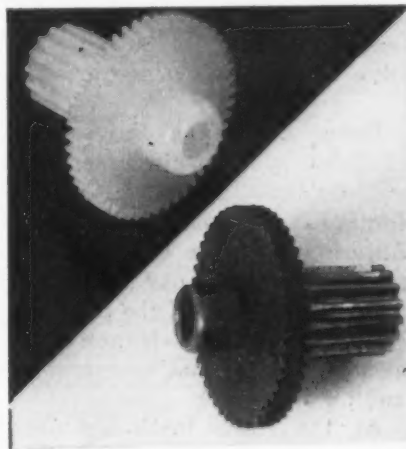
A move to conserve scarce metals by utilizing other materials for containers and packages is gathering momentum, National Production Authority reports. Since paper and other substitute materials may be in short supply soon, containers now used are being filled to the utmost.

One manufacturer, NPA says, is packaging as many as 48 television tubes in a single case, though he formerly packed each tube separately.

Open Morgantown Plant

Mathieson Chemical Corp., Baltimore, probably will begin operation this winter of the government-owned ordnance works in Morgantown, W. Va. Leasing negotiations are in progress between Mathieson and the Army, which built the \$75 million plant during World War II.

A wartime producer of chemicals for explosives, Morgantown is the second largest ammonia plant in America. In addition to anhydrous ammonia and methanol, it also is equipped to turn out formaldehyde and hexamine.



PLASTIC GEAR: By substituting molded Nylon for metal, General Electric has cut the cost of this gear used in a fan by 63 pct. The plastic gear is quieter and shows less wear.

SCHOOLS: Union Trains Leaders

Special courses for union executives . . . Feature government, industry relations . . . Colleges cooperate . . . Stress community activities, union responsibilities—By John Delaney.

College level training courses dealing with the role labor must play in government and the usual problems of human relations within unions are making steel labor leaders smarter than they were in the militant days when the United Steelworkers of America was forged into being.

Staff officers and local union men are not getting free rides to cap and gown degrees but they are getting intensive specialized training through "Educational Conferences" or "Labor Institutes."

A typical Institute today includes courses in labor's part in the government's stabilization program, wage and price control, civilian defense, international relations, union counselling, and the meaning of democracy.

WMC's Idea—The dignity and efficiency of organized classes had a beginning in the War Manpower Commission's Training Within Industry program started in 1943. Union leaders liked the idea, saw the benefits of schooling executives. And they held on to the idea. Today the program has spread to coast-to-coast magnitude, involving many schools and universities and costing hundreds of thousands of dollars a year.

Roots of the project are found at two schools: Pennsylvania State College, State College, Pa., and Antioch College, Yellow Springs, Ohio. In 1946 these two schools had 530 union students. This summer's class was 3000 and so far more than 20,000 men and women have been "educated."

Objectives—The union's training of its officials (at from \$150 to \$200 per student) has three objectives: (1) To develop skills of leadership and administration, (2)



USWA SCHOOL . . . At the college level

to develop skills and techniques for better job performance within industry, and (3) to develop better understanding of community problems.

Behind these general aims is the shrewder motive of equipping local union men with top level executive talents so they can cope with management representatives in discussing grievances, incentive systems, job rate structures, economics, and all other intricate situations that might now arise.

Union Pays—The Universities of Rhode Island, Ohio State, Indiana, Colorado, Kansas, and California have joined Penn State and Antioch College in the education plan. Local unions pay for courses and for time lost off the job. The USW defrays administration costs, and prints informative literature and publicity.

At the start, Institutes were held only in the summer. But the project grew too large. Winter courses are now held through university extension facilities.

Last winter, for instance, four Institutes were held at Dravosburg, Pa., the Penn State school center for union leaders at U. S. Steel's Irvin Works. Similar courses were held at Aliquippa, Johnstown, and Berwick, Pa.

Stress Local Program—The community relations part of the courses stresses participation in local affairs and problems. Unions seek community respect and support. Examples are cited of greatly increased Community Chest donations and town charities.

What does the steel industrialist think of arming union officials with knowledge? Union men feel that management should be entirely sympathetic. The union leader has to be fully an executive to understand the twists and turns of labor contracts and the workings of the massive labor structure. In short, college training minimizes confusion and gives the labor leader a fuller sense of responsibility. Steel men want him to have that.

Handling the reins of the union's program is Emery Bacon, Educational Director, a graduate of the University of Pittsburgh. He says that what has been done is only the beginning.

Rail Strikers Back at Work

Agreement of striking Birmingham Southern Railroad switchmen and conductors to return to work while their demand for a 95¢ per day wage increase for coupling and uncoupling cars is mediated has averted closing of several Birmingham industrial plants.

Six operations of Tennessee Coal, Iron & Railroad Co. were closed down before the walkout ended, but T.C.I. officials were readying them for operation the first of this week. Closing of other plants expected the first of the week was also averted.

Signs Escalator Contract

Willys-Overland is the latest car manufacturer to sign a cost-of-living type wage agreement with the UAW-CIO. The agree-

ment is for 5 years, running to June 1, 1955.

Terms of the settlement call for a 9¢ cost-of-living wage increase and also for a 4¢ annual improvement increase. Like other automotive agreements, the contract is not reopenable for negotiations on wage rates and other economic issues.

Willys-Overland has a record of operation unbroken by strikes since 1936. The new agreement provides additional vacation benefits, increased benefits for female workers during inventory and increased call-in pay rates for piece workers.

Weirton Seniority Plan Charted

Weirton Steel Co. bulletin boards now carry a picture of the ladder to success.

Under a seniority agreement between Weirton and the Independent Steelworkers Union, charts indicating the sequence of promotion from laborer to the top job in the department are posted.

Training Plan—Through these charts a worker can see for himself the various steps up the ladder. A step-by-step development plan provides the worker with training for the next higher post.

No Wage Limit Advance Notice

Wage Stabilization Board is notifying employers and unions that it cannot advise in advance the limitations within which new wage agreements may be written.

"If the board is to preserve the values of collective bargaining to the fullest practicable extent, it must stay out of the bargaining room," WSB declares. The board also warns against agreements which exceed existing wage regulations, tending to raise false hopes among workers.

Negotiations Break Down

Negotiations arranged by Federal Conciliator Robert W. Donahoo between Alabama Dry Dock and Shipbuilding Co. and striking CIO shipbuilding and maintenance men have broken down. The strike of 2000 men began July 23. They are asking a 25¢ per hr wage increase. The company offered 18¢.

Production

Zinc Limits Galvanized Output

Production of galvanized sheet will be limited in October and subsequent months because of the zinc shortage, and some National Production Authority orders will have to be cut back.

NPA is planning to issue formal instructions, expanding earlier telegraphic notices to sheet producers to compute the amount by which expected production for each month will fall below directed production. Producers are expected to deduct from their total purchase orders those orders for national defense and Atomic Energy Commission use.

Shortages thus produced are to be divided proportionately among warehouse orders, further converters' orders, and all other orders.

Steel producers have been told that they should offer to make

available substitute production equivalent to the deficit suffered by any individual purchaser. When the latter does not accept substitutions, the amount of galvanized sheet shortage is to be canceled.

About 17,000 tons of zinc will be lost this month because of strikes in the copper industry, NPA said. At least 12,000 tons may be lost from October production.

Generator Burnout Closes Mills

A short circuit which burned out the blooming mill generator at Keystone Steel & Wire Co., Peoria, last week resulted in the layoff of 609 out of 1015 production workers Monday. Sent to Chicago for repair by GE, the generator is expected to be in operation again by Oct. 8.

STEEL: Finished Shipments Down in July

As Reported to the American Iron & Steel Institute

STEEL PRODUCTS	CURRENT MONTH					TO DATE THIS YEAR				
	Carbon	Alloy	Stainless	Total	Pct of Total Shipments	Carbon	Alloy	Stainless	Total	Pct of Total Shipments
Ingot	90,283	18,829	1,216	110,328	1.9	*571,171	138,380	11,589	*721,120	1.6
Blooms, billets, tube rounds, sheet bars	148,111	42,412	1,813	192,336	3.2	*963,661	326,209	10,909	*1,300,779	2.8
Skelp	16,474			16,474	0.3	85,548			85,548	0.2
Wire rods	49,281	485	407	50,173	0.8	*481,581		2,676	*484,662	1.1
Structurals	394,659	2,796		397,455	6.6	*2,815,335	42,599	47	*2,857,981	6.2
Steel piling	39,125			39,125	0.7	*243,824			*243,824	0.5
Plates	624,421	27,062	1,471	652,954	10.9	*4,288,984	241,712	10,796	*4,541,492	9.9
Rails—standard	134,836	9		134,845	2.3	990,759	123		990,882	2.1
Rails—all other	10,666	3		10,669	0.2	77,869	40		77,909	0.2
Joint bars	8,011			8,011	0.1	77,487			77,487	0.2
Tie plates	36,018			36,018	0.6	270,055			270,055	0.6
Track spikes	12,708			12,708	0.2	97,979			97,979	0.2
Wheels	33,133	12		33,145	0.6	232,461	135		232,596	0.5
Axles	17,818	100		17,918	0.3	132,490	395		132,885	0.3
Bars—hot-rolled	510,352	178,019	3,006	689,377	11.5	*3,811,564	1,315,071	24,001	*5,150,636	11.2
Bars—reinforcing	150,730			150,730	2.5	1,069,611			1,069,611	2.3
Bars—cold-finished	111,744	24,442	3,053	139,239	2.3	885,860	192,554	24,086	1,102,500	2.4
Bars—tool steel	2,107	9,901		12,008	0.2	*18,835	*77,813		*96,648	0.2
Standard pipe	228,507	192	2	228,701	3.8	1,693,115	1,035	28	1,694,178	3.7
Oil country goods	133,637	9,729		143,366	2.4	964,625	123,011		1,087,636	2.4
Line pipe	216,531	25		216,556	3.6	1,707,899	694		1,708,593	3.7
Mech. tubing	50,937	17,568	304	68,807	1.2	390,980	166,217	3,576	560,773	1.2
Pressure tubing	21,327	1,273	771	23,371	0.4	150,732	11,765	5,840	168,337	0.4
Wire—drawn	184,782	2,377	2,436	189,595	3.2	1,834,145	31,563	18,164	1,883,872	4.1
Wire—nails, staples	55,540			55,540	0.9	503,519		25	503,544	1.1
Wire—barbed, twisted	14,361			14,361	0.2	129,718		1	129,719	0.3
Wire—woven fence	26,147			26,147	0.4	251,894			251,894	0.5
Wire—bale ties	8,767			8,767	0.2	61,171			61,171	0.1
Black plate	70,602			70,602	1.2	557,600			557,600	1.2
Tin & terneplate—hot-dipped	129,683			129,683	2.2	963,984			963,984	2.1
Terneplate—electrolytic	217,575			217,575	3.6	1,643,386			1,643,386	3.6
Sheets—hot-rolled	588,659	19,236	3,749	611,644	10.2	*4,771,845	183,568	23,971	*4,979,384	10.8
Sheets—cold-rolled	733,592	8,482	7,129	749,203	12.5	*5,704,449	71,033	57,554	*5,833,036	12.7
Sheets—galvanized	161,428			161,428	2.7	1,187,639	907		1,188,546	2.6
Sheets—other coated	20,272			20,272	0.3	152,492			152,492	0.3
Sheets—enameling	13,816			13,816	0.2	*123,908			*123,908	0.3
Electrical sheets, strip	10,713	50,374		61,087	1.0	85,387	365,114		450,501	1.0
Strip—hot-rolled	142,699	2,699	794	146,192	2.4	1,243,434	*24,934	4,447	*1,272,815	2.8
Strip—cold-rolled	114,538	1,523	12,289	128,350	2.2	1,087,348	17,070	115,765	1,220,181	2.6
TOTAL	5,534,588	415,546	38,440	5,988,574	100.0	*42,344,342	*3,342,347	313,455	*46,000,144	100.0

During 1950 the companies included above represented 99.0% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Revised.

STAINLESS: Windfall for Civilian Use

Military surplus of 10,165 tons of stainless steel given by DPA to civilian users . . . Benefits will come in November, December . . . What to do before switching to type 430 chrome.

Because of a revision of the military's fourth quarter stainless steel requirements, Defense Production Administration last week released an additional 10,165 tons of stainless for civilian use. To companies who make automobiles, appliances and other consumer durables (including furniture), and building hardware and trim it was a windfall. A nasty substitution problem is made less severe.

The increase is only 7 pct of expected fourth quarter stainless production and will be felt in November and December. October lead time is passed and it will take some squeezing to get it into November mill schedules.

The supplementary allocations, in net tons, are:

Consumer durables	4,300
Automobiles	3,735
Construction	1,000
Canada (through NPA)	400
General components (NPA)	200
Ordnance & shipbuilding (NPA)	50
Office of Intl. Trade	340
ECA	140

Used on Autos—Of the additional allocation, 9650 tons will be chromium stainless (400 series), and only 200 tons will contain nickel (the 300, or 18-8, series). Most of the straight chrome will be type 430, the grade the stainless steel producers have at last publicly agreed upon as a substitute for the more popular type 302. The latter, with its 8 to 10 pct nickel content, is banned in civilian goods.

Though it does not have the corrosion resistance of types 316 or 347, type 430 has been used in the auto industry for some time and will not be a problem for the manufacturers. But car owners will have to keep it clean and protect it with polish if they want to keep it bright.

For interior use in refrigerators, type 430 will not compare well with the nickel bearing stainless

which has been standard practice. Here, as in many other changeovers, fabricators can't switch without some careful study. Not only is corrosion resistance lower but there are some new angles to be learned in fabrication.

Steps Before Change—All the information needed to substitute type 430 for the 300 series—when substitution is possible—can be had from the stainless steel producers. They advise against a change without an engineering study, but are prepared to recommend changeovers in many cases.

Normal practice is to review each customer's order, job by job, but the customer should be sure that review is made. Many warehouse salesmen are now qualified to advise on substitution, too.

Since some 430 will be allocated for building exteriors, designers will have to plan on how users will clean it. If not, its greater vulnerability to corrosion than the

type 302 they formerly used may mean trouble.

More Work—Fabricators accustomed to type 302 can expect more steps in drawing or bending type 430 and scrap rates may be higher. Type 430 stainless can usually be reduced about 20 to 25 pct in the first draw (up to as much as 35 pct in some cases) and about 15 pct in subsequent draws. Annealing between draws may not be necessary; it may pay to warm blanks in water before drawing.

Dies designed for type 302 may have to be smoother and have larger radii to avoid cracking on type 430. It can't be bent as sharply, either. Inert gas shielded arc welding is recommended with an anneal after welding to reduce brittleness. Polishing usually requires an additional operation.

With these limitations in mind, type 430 can fill part of the gap left by the nickel shortage. By the same token it is not surprising that 90 pct of the manufacturers now using type 430 in place of the 18-8 grades plan to go back to 18-8 as soon as they can get it.

Dairy Equipment Shortage Coming

By the first quarter of 1952, working inventories of dairy equipment manufacturers will be noticeably depleted because of producers' inability to obtain sufficient quantities of controlled materials.

This prediction was made to National Production Authority by a manufacturer's advisory committee. Members said close to 35 pct of present output is for repairs and minor capital additions.

Normal Period Base—Consensus among the manufacturers was that the industry must operate at 75 to 85 pct of a normal 3-year production period in order to break even. Such a period, they said, was the 1948-50 era.

Defense production orders are available for some producers, but peak production may not be reached before next February.



"I'm quite satisfied with my present system."

ENAMEL: One Coat on Plain Steel

Called Ti-Loc, new process enamels non-premium steel with one coat . . . Can be sawed, drilled or punched . . . Developed by Strong Mfg. Co., Sebring, Ohio—By Gene Beaudet.

A long desired goal in the porcelain enameling industry has been reached by the Strong Mfg. Co., Sebring, Ohio. After several years of intensive research and testing they have succeeded in applying one coat of white titanium enamel directly to non-premium steel without the need for a ground coat.

The coating, called Ti-Loc, is applied by a special process developed by the company without the need for any major change in equipment from the conventional enameling plant. Common commercial grade enamel can be used.

One coat white titanium enamel has been successfully employed before but only on specially made sheets. Other processes using non-premium steels require two or more coats of enamel. Lustron succeeded in putting one coat of colored enamel on non-premium steel, but they didn't use white titanium enamel, raw material of the white appliance industry.

Less Chipping—This new coating has all the characteristics of commercially acceptable finishes such as acid and abrasion resistance, high reflectivity, color stability, etc., according to company officials. Furthermore, they claim the process permits application of a coating as thin as .003 in. compared with two or three times this thickness in other methods.

Since the amount of chipping resulting from mechanical shock becomes less as the thickness of the coating is reduced, Ti-Loc reduces chippage to a minimum. This factor together with greater adherence to the steel enables it to achieve greater flexibility.

Can Saw or Drill—While able to apply all commercial titanium enamels directly to steel, the proc-

ess is even more successful with those falling in the lower firing ranges. This is of extreme importance because the lower the firing range the less warping there will be of complicated or built up shapes. It makes possible widely expanded use of porcelain enamel as a finish and puts it on a much more competitive basis with other types of finishes than heretofore.

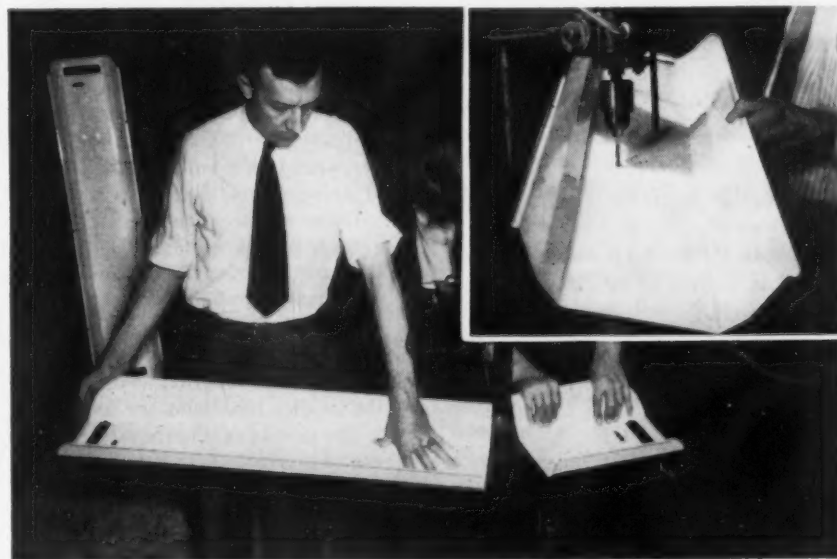
One of the unusual features of Ti-Loc is its ability to withstand sawing, shearing, punching and drilling with no harm to the coating. It holds particular significance for the architectural field in that it provides on-the-job fitting for porcelain enamel panels where it has previously been necessary to fabricate the panels beforehand.

Wide Use Seen—At present the process has been proved successful on a number of products, including fluorescent light reflectors which Strong has been making this way for the Westinghouse

Electric Corp. since April of this year. The company, which also makes porcelain enameled industrial reflectors, refrigerator and roasting pans for such firms as Westinghouse, General Electric and Philco, sees no reason why the process can't be used on all their products as soon as a complete changeover can be made.

From a cost standpoint the outlook seems most promising. Aside from the fact that it eliminates need for high priced steel in present one-coat applications, it appreciably cuts down the amount of reoperation occurring either in the one coat or two coat methods. Reoperation, the application of an additional coat where the previous one was unsatisfactory, is an important part of the cost picture in the industry.

While not willing to make any definite statement concerning additional applications, Strong officials feel the coating can be applied successfully to any product now being porcelain enameled. They also feel that its low chippage, flexibility and the possibility of enameling complicated shapes, without the need for reinforcing to prevent warpage, will open up the field to manufacturers of metal products now using other types of finishes.



NO CHIPPING: Paul Cecil, Strong Mfg. Co. ceramic engineer, has just sawed through this Ti-Loc fluorescent reflector without damaging the adjacent enamel.

WAGES: Restrict Raises of Salaried

New Reg. 3 limits merit or length of service raises to 6 pct of salary . . . Employer has alternative of granting same percentage as in '50 . . . Criticism by employees may be bitter.

Salaried, professional workers, and outside salesmen are not victims of a complete wage freeze but their employers are now considerably handicapped in granting substantial raises.

Newly-issued Reg. 3—by the Salary Stabilization Board—offers three alternatives for granting merit or length-of-service pay boosts. Each of them has a ceiling.

Six Pct Ceiling—An annual raise may not exceed 6 pct of an employee's total salary and he may not go higher paywise than the maximum range already established for his position or classification.

An optional course does not permit total increases over the percentage of salary granted in 1950. The third method allows an employer to give raises in accordance with an established salary plan put into operation on Jan. 25, 1951. The plan must have been in written policy statement or notice to employees.

Reg. 3 also deals with auxiliary pay practices, salaries for new employees, pay in new or changed capacities, and promotion or transfer of an employee to a higher position. The regulation is considered only a stopgap measure, to be replaced with an overall order.

Who Is Hurt—Criticism against Reg. 3 is bound to be bitter—from the employee's standpoint. It limits wages of a large group of professional men such as engineers and scientists and white collar personnel. They are in a good many cases not unionized and consider their salaries as lagging in the upward march of the cost of living.

In view of the demand for scientists and engineers, the regulation

may encourage job-hopping as a loophole for evading salary restrictions. At any rate, a regulation on merit raises, dealing with individuals, is a difficult one to enforce.

Hunt Nickel Black Marketeers

Action is being taken by some Office of Price Administration field representatives to determine precisely who has violated pricing regulations in the recently-exposed nickel black market.

OPS is only one of the Washington agencies interested in finding just how certain dealers in nickel anodes have been able to demand, and get, as much as \$4.50 per lb for their wares. Others that soon may be able to reveal their findings on the bootleg activities are Dept. of Justice, Bureau of Internal Revenue, and National Production Authority.

These federal agencies have at

Maligned But Needed

Much maligned by some shoddy-thinking politicians as potential turncoats to private capitalistic interests, the industrialist in Washington is now getting all respect due him. Reason: he is desperately needed to guide phases of defense mobilization.

Industry is soon to be under greater pressure from Mobilization Director Charles E. Wilson to assign more topflight executives to Washington for temporary government service. Good men are urgently needed, Mr. Wilson says. He implies that industry has them.

The new appeal to industrial leaders to sacrifice their time and effort at little or no compensation will be made at Business Advisory Council's meeting at Hot Springs, Va., on Oct. 26.

hand the report of a Senate small business subcommittee pointing out a "vicious and immoral system of profiteering" apparently operating in the New York area. The report says nickel and nickel anodes are so sought after that 30 hijackings or warehouse thefts have occurred since Jan. 1.

Pig Tin Use Restricted

Restrictions on the use of pig tin will apply during the fourth quarter and for an undetermined longer period.

In an amendment to its basic tin order, M-8, National Production Authority ordered the continuing restriction, which would prevent manufacturers, processors, and others from using more than 90 pct of the metal utilized in the average quarter of the base period. The base period extended from Jan. 1 to June 30, 1950.

Originally, the order restricted third quarter use of pig tin.

All other provisions of M-8 will hold. The order defines pig tin as any metal containing 95 pct or more by weight of tin, including anodes, small bars, and ingots.

Industry Controls This Week:

NPA Orders

M-8 Amend.—Continues restrictions on pig tin use.

OPS Orders

GCPR, Supplementary Reg. 62—Grants rate increases to water shippers of coal to East Coast ports.

CPR 22, Amend. 6 and CPR 30, Amend. 14—Allows manufacturers to work out own methods for computing cost increases.

CPR 67, Amend.—Allows resellers to use ceiling prices before approval.

Chemical Rating Use Curtailed

Effective immediately, only Defense Dept. and Atomic Energy Commission may use defense ratings to obtain chemicals.

All others must buy chemicals on the open market. Only exception will be a DO-Z-1 rating which NPA will issue to an essential user.

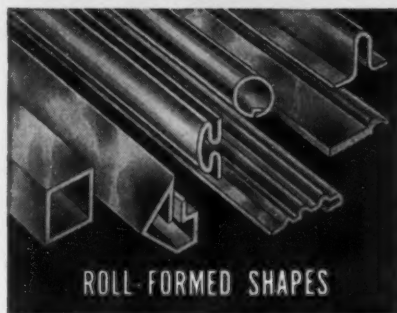
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Illustration: A stylized drawing of a hand holding a pen, writing on a document. The drawing is enclosed in a rectangular frame with a decorative border. The hand is positioned at the top right, and the pen is pointing towards the bottom left. The document has some text and a large number '2' visible.

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Subcontracting

Exhibits:

Subcontractor shows announced in Commerce Dept. bulletins.

Dates and locations of proposed subcontractor exhibits sponsored by the armed forces are going to be publicized in 2 Commerce Dept. bulletins.

Munitions Board has authorized presentation of this information in the Commerce Dept.'s *Synopsis of Proposed Procurements* and *Synopsis of Contract Award Information*. This joint effort by Defense and Commerce is expected to be especially beneficial to small manufacturers seeking rearmament contracts.

Other Helps—As an additional aid, small business specialists in military purchasing offices will survey unclassified, advertised, and negotiated procurement announcements exceeding \$10,000 in value to determine which can be handled by small firms. They are also directed to see that such procurements are publicized in Commerce Dept. synopses.

Keystone Starts Fuze Production

Artillery fuze production is now under way at Keystone Watch Division, The Riverside Metal Co., Riverside, N. J. Army Ordnance awarded the \$2 million contract last March.

Manufacture involves fabrication and assembly of 40 parts in four separate assemblies. Keystone recently completed installation of the special equipment necessary to produce the 800,000 fuzes.

Subcontractors Exhibit in N. J.

Small manufacturers will have a chance to bid on defense work at a subcontractors' exhibit on Oct. 4-5 in Paterson, N. J. A series of panel discussions on subcontracting procedures will be held the preceding day, Oct. 3.

Joint sponsors are Armed Forces Regional Council, National Production Authority, and Paterson Chamber of Commerce. Exhibits will be at the Alexander Hamilton Hotel, from 11 a.m. to 8 p.m.

Defense Contracts

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation no. or proposal, and opening date. (Invitations for Bids numbers are followed by "B," requests for proposals or quotations by "Q.")

Spare parts, Murphy Diesel Co., 214 itm, 22255, "B," Oct. 23.
Spare parts, Chrysler Corp., 531 itm, 28159 "B," Oct. 16.
Welder-arc, 52 ea, YDSO-1004-52 "B," Oct. 15.
Fastener-belt-pistol, 328000 ea, 52-304B, Oct. 12.
Markers—minefield, 11680 ea (04-203-52-373), Oct. 3.
Seal conveyers with motors, 8 ea (ENG-46-02-52-42B), Oct. 2.
Cooling system parts, 52-82B, Oct. 12.
Valve, 300 ea (ENG-23-065-52-168B), Oct. 1.
Spacer, 20000, 52-120B, Oct. 12.
Spacer, 100, 52-120B, Oct. 12.
Spacer, 1500, 52-120B, Oct. 12.
Spring, 1100, 52-239B, Oct. 12.
Spring, 1530, 52-239B, Oct. 12.
Charger, 200, 52-338, Oct. 12.
Synchronizer, ignition, 100, 52-338B, Oct. 12.
Tester, elec. automotive, 140, 52-338B, Oct. 12.
Tester, elec. exhaust, 355, 52-338B, Oct. 12.
Tester, ignition, 710, 52-338B, Oct. 12.
Drive, 700, 52-264B, Oct. 12.
Drive, 300, 52-364B, Oct. 12.
Drive, 300, 52-264B, Oct. 12.
Door, 45, 52-261B, Oct. 12.
Door, 45, 52-216B, Oct. 12.
Door, hull, 60, 52-216B, Oct. 12.
Lock, tur hatch, 170, 52-242B, Oct. 12.
Hook, tow, 1400, 52-242B, Oct. 12.
Shaft, steering, 800, 52-242B, Oct. 12.
Lever, transfer, 707, 52-242B, Oct. 12.
Link, traveling lock, 200, 52-242B, Oct. 12.
Lever, steering, 25, 52-242B, Oct. 12.
Bolt, 1000, 52-276B, Oct. 12.
Grommet, 3700, 52-276B, Oct. 12.
Rod, 800, 52-276B, Oct. 12.
Cover, 100, 52-276B, Oct. 12.
Grommet, 1050, 52-276B, Oct. 12.
Head, cylinder, 725, 52-276B, Oct. 12.
Screw cap, 3000, 52-276B, Oct. 12.
Handle, 300, 52-276B, Oct. 12.
Strut assy., 845 ea. (11-070-52, 167B), Oct. 12.
Nuts, 246 ea. (11-070-52, 167B), Oct. 12.
Piece, 105 ea. (11-070-52, 167B), Oct. 12.
Pin, 410 ea. (11-070-52, 167B), Oct. 12.
Turnbuckle, 135 ea. (11-070-52, 167B), Oct. 12.
Brace assy., 200 ea. (11070-52, 167B), Oct. 12.
Equilibrator assy., 1082 ea. (11-070-52, 167B), Oct. 12.
End assy., 273 ea. (11-070-52, 167B), Oct. 12.
Mechanism-recoil, 880 ea. (11-070-52, 167B), Oct. 12.
Carriage-howitzer, 800 ea. (11-070-52, 167B), Oct. 12.
Aircraft engine instruments, 4 itm. (IR 150788-C-Q), Oct. 7.
Grinder, 8 ea., 52-171-Q, Oct. 1.
Nut assy., 69 itm., 52-167-Q, Oct. 1.
Shear-rotary and squaring, 2 ea. 52-208-Q, Oct. 1.
Punch-turret, 146 ea., 52-233-Q, Oct. 1.
Welder-arc, 2 ea., 52-148-B, Oct. 1.



"This ward is full of manufacturers. All they do is yell 'Controls, Taxes, Controls' over and over."

Here's how two plants solved **ACID SHORTAGE** problems...



Case History No. 1

A steel pickling plant handling hot rolled coils reduced sulfuric acid consumption 50% without interrupting normal production. And they got a brighter, cleaner pickling job!

How? By supplementing their sulfuric acid with Wyandotte A.E., the new, easy-to-handle dry acid cleaner.

Case History No. 2

A manufacturer of steel wire products, using oblique tumble barrels, after heat treatment to remove scale, solved his acid shortage problem by substituting the new Wyandotte A.E. Work came out brighter! And working conditions were better too—with no obnoxious fumes!

Ask your Wyandotte Representative to tell you more about Wyandotte A.E. Or, if you're having a cleaning problem, of any sort, write us. Free technical help is available.

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THE NEW DRY ACID CLEANER

- Wets out and rinses fast
- Gives brighter finishes
- Is easy to handle—not dusty
- Eliminates water and acid spotting
- Does not give off obnoxious fumes
- Has long solution life
- Is less critical to control

THE WYANDOTTE LINE—products for burnishing and burring, vat, electro, steam gun, washing machine and emulsion cleaning, paint stripping, acid pickling, related surface treatments and spray-booth compounds. An all-purpose floor absorbent: Zorball. In fact, specialized products for every cleaning need.

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When you use hydrogen in the following amounts:

less than 10,000 cu. ft./day it pays to dissociate cylinder ammonia

between 10 and 20,000 cu. ft./day . . . it pays to dissociate tank-car ammonia

And thousands of metal-treating plants throughout the country find that the ammonia it pays to use is

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Anhydrous Ammonia

Du Pont "National" is minimum 99.99% ammonia . . . yet it costs no more! It's always dry—moisture content is less than 50 parts per million. What's more,

"National" Ammonia in cylinders is readily available. Distributors and stock points are located across the country to assure you of fast delivery.

Do you know these
other Du Pont chemicals
for metal treating?

HYDROXYACETIC ACID 70%—For bright dipping of copper, electro-polishing of stainless steel and electroless plating of nickel.

METHANOL—Source of hydrogen and carbon monoxide for an efficient reducing atmosphere in many metallurgical operations, and for cleaning of metal parts during fabrication.



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Defense Contracts

Ships:

Navy contracts for 13 new LSTs, faster than World War II models.

Three companies in as many states will participate in the building of 13 landing craft for the Navy, sharing in contracts amounting to more than \$40 million.

Vessels to be built are landing ships, tank (LSTs), 385 ft. long, with a maximum displacement of 5786 tons. Companies sharing the order are Bath Iron Works, Bath, Me., three ships; Ingalls Shipbuilding Corp., Pascagoula, Miss., five; and Christy Corp., Sturgeon Bay, Wis., five ships.

More Powerful—The Bath firm was awarded contracts for two other LSTs in July. It has been designated lead yard for the LST program, and will procure steel, anchor windlasses, pumps, and additional equipment for all the new construction.

Two experimental LSTs built during World War II are prototypes for the projected vessels. Each of these will be powered by four diesel engines generating a total of 6000 hp. This figure is markedly greater than the 1800 hp ordinarily available to LSTs during the recent war.

Contracts Reported Last Week

Machines—Colonial Broach Co., Detroit.
Road sweepers—Elgin Sweeper Co., Elgin, Ill.
Mixer—Construction Machinery Co., Waterloo, Iowa
Mixer, concrete—Chain Belt Company, Milwaukee
Mixer, concrete—Construction Machinery Co., Waterloo, Iowa
Crane components—Harnischfeger Corporation, Milwaukee, Wis.
Air compressor—Davey Compressor Co., Kent, Ohio
Ditching machines—Gar Wood Industries Inc., Findlay, Ohio
Road sweeper—Wayne Mfg. Co., Pomona, Calif.
Road grader—Rome Grader Corp., Rome, N. Y.
Clamshell buckets—The Four Wheel Dr., Pacific Co., Los Angeles, Calif.
Spare parts—Thew Shovel Company, Lorain, Ohio
Concrete paver—The Foote Company, Inc., Nunda, N. Y.
Road grader—Rome Grader Corporation, Rome, N. Y.
Snow plow—Klauser Mfg. Co., Dubuque, Iowa
Snow plow—Wm. Bros. Boiler & Mfg. Co., Minneapolis
Crane—Bay City Shovels, Inc., Bay City, Mich.

Defense Contracts

Tailshafts—Camden Forge Co., Camden, N. J.
 Tailshafts—Standard Steel Works Div., Baldwin-Lima-Hamilton Corp., Burnham, Penna.
 Tailshafts—Isaacson Iron Works, Seattle
 Washing machines—The Maytag Co., Newton, Iowa
 Generator sets—R. H. Sheppard, Hanover, Pa.
 Power transfer panels—General Electric Supply Co., Philadelphia
 Ventilation heaters—McQuay Incorporated, Minneapolis
 Gasoline filters—Warren Lewis Company, Tulsa, Okla.
 Machines—Baugh Machine Tool Co., Springfield, Mass.

Submarines:

Senate tells Navy not to exceed its estimates on submarine costs.

Navy builders of two experimental submarines, not to be powered by nuclear energy, will have to stay within a \$49 million budget, the Senate Armed Services Committee says the sum corresponds to Navy estimates.

The Senate was less liberal than the House, which wanted to allocate \$50 million to the Navy for the job. Since the Navy now estimates the job at \$48,238,000, the senior legislators felt justified in reducing the House figure.

Superior Performance—Authority to build the new-type submarines was first granted in May, 1947, when the cost limitation was set at \$30 million. The subs are expected to be far superior in performance to the less complex fleet-type models used at the end of World War II.

The project probably will be completed within the next 4 to 6 months.

Hudson's Second Airplane Order

Hudson will build rear fuselage and tail sections for the twin-jet B-57 Martin Canberra Night Intruder Bomber. This is Hudson's second aircraft order. The company will also build major components for the R-3350 Wright aircraft engine.

Initially, it is expected about 250,000 sq ft of floor space will be devoted to the new aircraft orders. The Canberra is an English-designed plane used as a high altitude radar bomber.

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FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

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LUBRICATION IS
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THE THOMAS PRINCIPLE GUARANTEES
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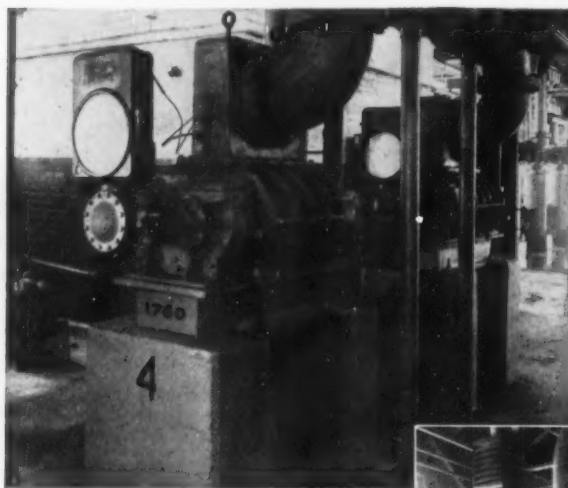
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ALL PARTS ARE
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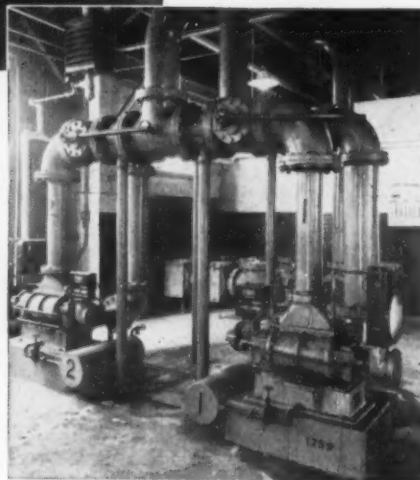


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The four meters illustrated are part of a total installation of nine R-C Meters in a large processing plant. These units measure acetylene gas sold to nearby manufacturers, who also use R-C Meters at the receiving ends. Capacities range from 3,000 cfh to 130,000 cfh.



YOU CAN ALWAYS trust R-C METERS

If you're measuring gas for production processes, you can't take any chances on quantities. If you are buying or selling it, you need cash register accuracy. You want equal precision for departmental cost accounting.

The permanent accuracy of R-C Positive Displacement Meters has long been proved for all these purposes by manufacturers and utilities which buy, sell and use gas. Four important reasons account for this unvarying reliability:

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2. Accuracy is not subject to adjustment of meter or recorder by operators or other persons.
3. Accuracy is not affected by reasonable overloads.
4. Accuracy is permanent because measuring chambers are surrounded by precision-machined, cast-iron surfaces.

The 31 standard sizes of R-C Meters give capacities from 4,000 cfh to 1,000,000 cfh. They are extremely compact, permitting installation in cramped spaces. Indicating and recording instruments are available for all types. For whatever purposes you measure gas, you can permanently depend on R-C Meters. Ask for Bulletin 40-B-14 or write us your specific problem.

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Expansion

Fast Tax Write-Offs

110 certificates
issued by DPA since
Aug. 18 moratorium
totaling \$149,450,249
3453 authorized to date
totaling \$9,163,911,490

Latest DPA certificates listed by company, use, amount applied for, amount eligible, and pet approved.

C. O. Hoffacker Co., Cranston, R. I., machine tools, \$7,330, \$7,330, 85.
Pitney-Bowes, Inc., Stamford, Conn., aviation parts, \$946,770, \$771,770, 75.
National Store Fronts Co., Inc., Nashua, N. H., aluminum extrusions, \$2,149,990, \$2,134,990, 75.
Doelcam Corp., Boston, Mass., aircraft instruments, \$997,000, \$846,702, 80.
Niles-Bement-Pond Co., Warwick, R. I., fuel pumps, aircraft, \$374,800, \$371,070, 75.
Miesel Press Mfg. Co., Boston, Mass., aircraft engine parts, 85.
The National Automatic Products Co., Berlin, Conn., aircraft parts, 80.
Hartford Electric Steel Corp., Hartford, Conn., steel castings, 75.
Van Keuren Co., New Durham, N. H., gases, 80.
Peerless Aluminum Foundry Co., Inc., Bridgeport, Conn., aluminum castings, 75.
K. Smit & Sons, Inc., Murray Hill, N. J., cutting tools, \$26,378, \$26,378, 85.
Airtron, Inc., Linden, N. J., military items, \$51,457, \$43,672, 85.
A. E. Bausenbach, Inc., Buffalo, N. Y., aircraft parts, 85.
Engelberg Huller Co., Inc., Syracuse, N. Y., aircraft parts, 80.
Air Associates, Inc., Teterboro, N. J., aircraft parts, 85.
Twin Coach Co., Buffalo, N. Y., aircraft parts, 80.
J. S. Thorn Co., Holmesburg, Philadelphia, Pa., aluminum extrusions, \$489,074, \$478,074, 75.
R. D. Werner Co., Inc., Greenville, Pa., aluminum extrusions, \$529,861, \$529,861, 75.
Bristol Aluminum Co., Bristol, Pa., aluminum extrusions, \$176,468, \$176,468, 75.
Michael Flynn Mfg. Co., Philadelphia, Pa., aluminum extrusions, \$705,624, \$705,624, 75.
Kaiser Metal Products, Inc., Bristol, Pa., aircraft, \$4,100,000, \$3,919,000, 75.
Kaiser Metal Products, Inc., Bristol, Pa., aircraft, \$350,000, \$350,000, 75.
Kaiser Metal Products, Inc., Bristol, Pa., aircraft, \$668,000, \$629,900, 75.
I-T-E Circuit Breaker Co., Philadelphia, Pa., engine parts, \$1,127,340, \$924,340, 75.
Pittsburgh Screw & Bolt Corp., Pittsburgh, Pa., industrial fasteners, 60.
Pittsburgh Screw & Bolt Corp., Neville Island, Pa., industrial fasteners, 60.
York Electric & Machine Co., Inc., York, Pa., ordnance, 90.
Bovaird & Seyfang Mfg. Co., Bradford, Pa., compressor units, 90.
Blair Strip Steel Co., New Castle, Pa., cold strip steel, 60.
The Warner & Swasey Co., New Philadelphia, Ohio, machine tools, \$201,598, \$201,598, 75.
Bower Roller Bearing Co., Detroit, Mich., roller bearings, \$759,474, \$758,798, 75.
The Steel Improvement & Forge Co., Cleveland, Ohio, aircraft, \$107,213, \$107,213, 85.

Expansion

Waco, Inc., Dearborn, Mich., aluminum extrusions, \$1,623,650, \$1,578,650, 75.

The Lewis Machine Co., Cleveland, Ohio, machine tools, \$28,646, \$12,941, 90.

The Tool-Die Engineering Co., Cleveland, Ohio, dies, \$33,732, \$31,732, 80.

Automatic Die & Products Co., Maple Heights, Ohio, ordnance item, 85.

The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, hydraulic presses, 75.

Rulas Collet Mfg. Co., Cleveland, Ohio, collets, 75.

Kehrig Mfg. Co., Utica, Mich., tank kits, 75.

Atlantic Foundry Co., Akron, Ohio, steel castings, 75.

Mayes Tool Co., Detroit, Mich., gages, gears, 80.

Midland Steel Products Co., Cleveland, Ohio, ordnance items, 75.

Vinco Corp., Detroit, Mich., aircraft parts, 80.

The Hoover Co., Canton, Ohio, military items, \$140,000, \$134,576, 75.

The G. A. Gray Co., Cincinnati, Ohio, metal planers, \$49,745, \$17,125, 85.

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., milling machines, \$1,779,068, \$1,596,772, 75.

Dana Corp., Fort Wayne, Ind., aircraft, \$5,200,000, \$5,460,000, 75.

Martin Oil Service, Inc., Chicago, Ill., diesel tugboat, \$196,870, \$196,870, 70.

Superheater, Inc., East Chicago, Ind., power equipment, 60.

Smith Pattern Works, Inc., Indianapolis, Ind., metal patterns, 90.

Webster Electric Co., Racine, Wis., military items, 75.

Pittsburgh Screw & Bolt Corp., Gary, Ind., industrial fasteners, 60.

Haber Corp., Chicago, Ill., aircraft parts, 85.

Beloit Iron Works, Beloit, Wis., paper machinery, 50.

Berlin Chapman Co., Berlin, Wis., shipping covers, metal products, 75.

Birtman Electric Co., Rock Island, Ill., military items, 80.

Ross Gear and Tool Co., Lafayette, Ind., military steering gear, 80.

Sciaky Brothers, Inc., Chicago, Ill., welding equipment, \$439,564, \$390,930, 60.

Superior Steel Products Corp., Milwaukee, Wis., die sets, \$56,891, \$56,891, 90.

World Tool & Engrg. Co., Minneapolis, Minn., aircraft parts, 80.

McDonnell Aircraft Corp., St. Louis, Mo., airplanes, \$13,473,529, \$9,589,222, 70.

McDonnell Aircraft Corp., St. Louis, Mo., airplanes, \$1,000,000, \$1,000,000, 80.

McDonnell Aircraft Corp., Robertson, Mo., airplanes, \$358,437, \$358,437, 75.

McDonnell Aircraft Corp., Robertson, Mo., airplanes, \$1,175,000, \$250,000, 75.

McDonnell Aircraft Corp., Robertson, Mo., airplanes, \$75,000, \$75,000, 75.

McDonnell Aircraft Corp., Robertson, Mo., airplanes, \$2,066,203, \$450,000, 85.

Combustion Engineering-Superheater, Inc., St. Louis, Mo., power equipment, 60.

General Metals Corp., Houston, Texas, drop forgings, 75.

Oceana Tool Mfg. Co., Inc., Santa Monica, Calif., cutting tools, \$128,618, \$115,618, 80.

Western Gear Works, Lynwood, Calif., gears, \$13,357, \$13,357, 90.

Pioneer Broach Co., Los Angeles, Calif., broach tools, 90.

Progressive Machine Co., Los Angeles, Calif., military items, 80.

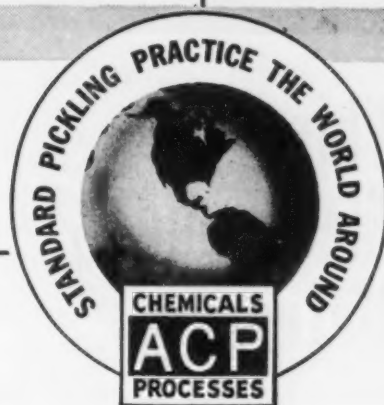
Sampson Motors, Inc., Los Angeles, Calif., aircraft parts, 80.

Ralph N. Brodie Co., San Leandro, Calif., military items, \$485,953, \$287,031, 80.

Solar Aircraft Co., San Diego, Calif., airplane parts, \$101,652, \$101,652, 75.

THIS IS THE TIME TO

SAVE PICKLING ACID!



Here are some ways to pickle more steel with less acid:

1. IMPROVE THE EFFICIENCY OF YOUR PRACTICE

Use every available pound of acid before dumping, by:

- Operating baths until more than the usual amount of iron accumulates,
- Stopping the additions of acid sooner than usual,
- Offsetting the slower pickling by raising bath temperature to boiling,
- Lengthening pickling time for last one or two batches.

Do not, if possible, dump bath with as much acid content as previously. Dump only when bath fails to work after above recommendations have been followed.

2. IMPROVE THE CHEMICAL EFFICIENCY OF YOUR PICKLING

Utilize every available pound of acid before dumping, by:

- Increasing the proportion of "RODINE"® in the bath up to 1% by volume of the acid.

The increased amount of "RODINE" will:

- Save the acid now needlessly wasted dissolving good metal,
- Retard from build-up, thus saving acid by reducing number of times tanks must be dumped.

Write for further information on saving pickling acids.

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This Electronic Meter

installed in an air conditioned room operates in an oil bath. It has a circulating oil system which allows oil to flow constantly over the balls preventing temperature changes while the balls are measured.

It is used to control and check size, gauge and sphericity of Steel Balls from the Gauging Department.

This electronic meter is capable of measuring as fine as .000005". In the glass vials are master balls, the size, gauge and sphericity of which have been accurately determined by the use of the Johansson Blocks.

Whenever you need precision balls of extremely fine tolerances, perfect surface finish, sphericity and size accuracy—specify Universal Precision Balls. They reduce friction, wear and maintenance costs to an absolute minimum. All Universal Balls are 100% inspected and individually gauged.

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PRECISION BALLS OF CHROME
AND STAINLESS STEEL, BRONZE
AND SPECIAL METALS.

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Construction

Inquiries and Awards

Fabricated Steel awards this week include the following:

258 Tons, three span W F beam bridges. Oscar L. Olson, Montgomery, Vt., low bidder. Completion date Sept. 1, 1952.

Fabricated Steel inquiries this week include the following:

120 Tons, Great Barrington, Mass., bridge over Housatonic River. W. W. Wyman Inc., Greenfield, low bidder. Completion date Oct. 31, 1952.

Reinforcing Bar awards this week include the following:

700 Tons, Willow Springs, Ill., Buick jet engine plant addition, to Ceco Steel Products Co.

650 Tons, Northfield, Ill., Harms Road intercepting sewer, to Joseph T. Ryerson and Sons.

600 Tons, Hagerstown, Md., U. S. Engineers, Blue Ridge Summit, to U. S. Steel Supply Co.

200 Tons, Chicago, Allstate Insurance Co., to Joseph T. Ryerson and Sons.

150 Tons, Cleveland, Gordon Park improvements, to U. S. Steel Supply Co.

100 Tons, Riverdale, Ill., Water Supply, to Joseph T. Ryerson and Sons.

Reinforcing Bar inquiries this week include the following:

6000 Tons, Lawrence, Ind., Army Finance Center, Corps of Engineers.

900 Tons, Rochester, Minn., Male clinic and hospital.

755 Tons, Chicago, Reinforced concrete hangar, Transworld Airlines, Inc.

600 Tons, Detroit, Pumping Station.

394 Tons, Hinsdale, Ill., Hinsdale Sanitarium and Hospital.

365 Tons, Chicago, Dentistry, medicine and pharmacy bldg., University of Illinois.

230 Tons, Hammond, Ind., Tank Farm, Wolf Lake.

190 Tons, Toledo, Library and law school, University of Toledo.

160 Tons, Champaign, Ill., Dormitory, University of Illinois.

150 Tons, Toledo, Dormitory, University of Toledo.

Inco Completes New Shaft, Mill

International Nickel Co. of Canada has completed two projects—a new shaft and a new concentrator—in its Creighton mine underground expansion program.

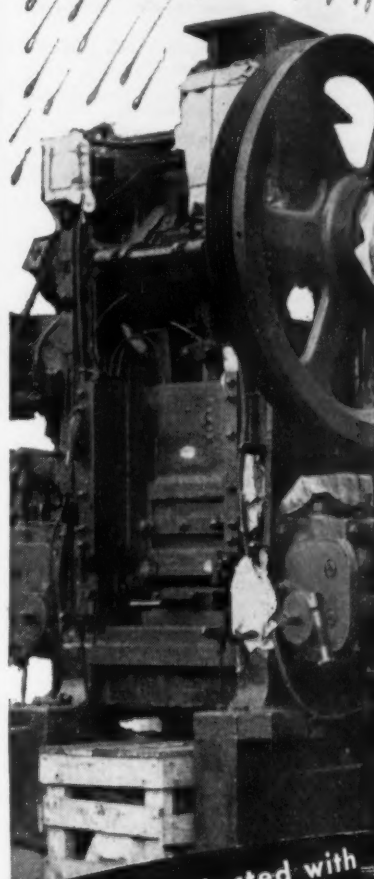
The new shaft is Inco's thirteenth to be put in operation in the Sudbury District. The new mill, which concentrates ore before transportation to the smelter at Copper Cliff, has a capacity of 10,000 tons per day.

Builds Huge New Transformers

Power aplenty will be supplied by five transformers to be built by Westinghouse Electric Corp. for two public utilities.

Three of the transformers, destined for Detroit Edison Co., will be the most powerful in the world. The others, for Central Illinois Public Service Co., will be the largest in physical size.

MACHINES WON'T RUST OUTDOORS



when protected with
**HOUGHTON'S
RUST-VETO
344**
rust preventive coating

You'll store equipment or parts outdoors without a worry when they're coated with RUST-VETO 344! It withstands all kinds of weather—expands and contracts with the metal—won't come off till you want it to! This black, thin-film preventive is easily sprayed or painted on idle machines. And just as easy to remove when putting them back in service again. Economical... one coat lasts a year or more! Write for bulletin on industrial rust preventives for all uses. E. F. Houghton & Co., Philadelphia 33, Pa.



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This Week in Washington

Harvey's Aluminum Loan Tied Up

Congressman charges Harvey walked into Federal till with little security for RFC loan . . . Harvey official retorts loan isn't political . . . Will controls be needed in '53?—By George Baker.

Demands for a Capitol Hill investigation of the Harvey Machine Co. proposal to build an aluminum plant in western Montana are being weighed by a congressional committee. (See p. 67.)

Rep. John P. Saylor, R., Pa., charges that Lawrence Harvey, executive vice-president of the Los Angeles firm, "walked into the Federal Treasury" and almost got a \$46,000,000 government loan "with little or no security."

"Further Study"—Interior Dept., after first approving the proposed loan, last week asked that it be held up "for further study." Secretary Chapman quickly followed up this move with a Defense Electric Power Administration order enforcing conservation of electric power in the Pacific Northwest.

Saylor says Chapman, in a move to build up northwest industry, produced a proposal requiring Harvey to put up only \$3,500,000 in cash, equipment, land, and engineering. This sum, he states, included an \$8,200,000 government surplus aluminum castings plant which Harvey bought for \$1,503,000 after World War II. Harvey was "talked into" accepting the offer by Chapman, according to the Pennsylvania congressman.

Harvey Replies—In Los Angeles, a Harvey official said the proposed loan is "completely in the public interest."

"This is in no sense a political loan," he declared. "It is a loan that we consider necessary for the future of aluminum, and one that will certainly prove profitable for the government."

Rep. Mike Mansfield, D., Mont., said he had supported the Harvey loan application on the assumption that the Interior Dept. "would conduct a complete investigation before arriving at an agreement."

Power Shortage—Government power experts predict that some industrial demands for electric service will be unfilled by the end of this year.

Current power shortage probably will become increasingly acute until there is what officials term "a staggering shortage of 4,000,000 kilowatts by the end of 1953."

Mobilizer Wilson has asked aluminum companies to reply promptly on possibilities and costs of relocating some of their plants from

the Pacific Northwest to areas with more power.

Mounting electrical shortage is due to increased demands for power—industrial, commercial, and domestic—since the outbreak of the Korean war and to materials shortages.

Below Danger Point—By the end of 1951, the operating margins will slip below the danger point, and some industrial demands will be without electric service, officials say.

Reduced material allotments for the electric power industry probably will leave the nation with a shortage of at least 1,500,000 kw in 1952, and an additional shortage of 2,500,000 kw in 1953.

Near, Already?—Officials of two control agencies this week dropped hints that the nation may be closer to reaching the peak of its mobilization drive than had—until recently—been expected.

Price Boss Mike DiSalle dropped the word that price controls will no longer be necessary by 1953, because production will by that time have caught up with needs.

A price increase today is news, DiSalle said. He claims there has been only nine-tenths of 1 pct increase in prices since February. "That is a good indication that things are under control," he states.

Manpower Drain—At the Defense Production Administration, officials are predicting that the biggest drain on manpower, materials, and production facilities will be felt in the last 2 months of this year.

From then on, production of military goods will continue to climb until late in first-quarter 1952. Problem of whether or not this peak rate will be sustained or allowed to drop back is yet to be settled. Decision probably won't be reached until later this year.



TAX HEARING: Roswell Magill, left, former under-secretary of the Treasury, said it is high time to re-examine federal expenditures which make high taxes necessary. He was before the House-Senate Committee on Reduction of Federal Spending. Sen. Byrd, right, said that Congress is scraping the bottom of the barrel in the pending tax bill.

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ROLLING MILL EQUIPMENT

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*Dependable
Production*

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Four-Hi Reversing Mills

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ROLLS AND ROLLING MILL EQUIPMENT
FOR THE IRON, STEEL AND
NON-FERROUS
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QUOTAS: Automakers Seek Extension

NPA asked to stretch output limitations through first quarter '52 . . . Duplicate order cancellation may ease supply of steel . . . May get more stainless . . . Copper, aluminum tight.

Automobile manufacturers last week urged NPA to extend current production limitations through first quarter 1952.

Production is now permitted at the rate of 1,200,000 passenger cars for the third quarter, and 1,100,000 cars for the fourth quarter. If no change is made for first quarter 1952, the automobile industry will operate according to the following existing percentages of total authorized production:

	PCT
Checker Cab Mfg.	0.10
Chrysler Corp.	21.65
Crosley Motors, Inc.	.35
Ford Motor Co.	21.35
General Motors Corp.	41.35
Hudson Motor Car Co.	2.95
Kaiser-Frazer Corp.	1.55
Nash-Kelvinator Corp.	3.30
Packard Motor Car Co.	2.15
Studebaker Corp.	4.25
Willys-Overland Motors, Inc.	1.00
Total	100.00

NPA last week issued the following summary to representatives of the automobile industry:

Steel—One problem is the inability of many companies in the industry to find steel mills which will accept fully validated orders for all steel allocated. NPA expects that this situation will ease in the very near future when all duplicate orders for steel are cancelled and additional room thus created on the mill schedules.

Stainless Steel—The industry pointed out that its need for stainless steel is confined almost entirely to certain ferrochrome alloys. Very little nickel-stainless is needed. NPA said that the demand for chrome-stainless steel seems to be easing and that if this condition continues, the auto industry should receive an increasing percentage of its needs. At the present time, NPA said, auto builders have been allotted 84 pct of their fourth quarter needs, but are still about 4,750,-

000 lb of stainless steel short of their full requirements.

Copper—NPA reported that while some expansion of copper output is expected in 1952, the amount will be small and increasing military demands will take this increase and more. Substitutions for copper wherever practicable were urged since inventories have been depleted by more than 300,000 tons in the past 2½ years and since the entire movement of copper through the economy is now on a hand-to-mouth basis. Because of the critical shortage, stockpiling by the government has been suspended for the time being, and some consideration is being given to further emergency withdrawals from the national stockpile.

Aluminum—Primary aluminum continues to be short, NPA told

the industry. The movement of scrap aluminum to smelters for conversion into secondary aluminum has declined in the past few months because of pricing uncertainties. Primary aluminum is still being stockpiled, but since the auto builders are mostly concerned with secondary aluminum, this is not regarded as a problem.

On the basis of an informal survey, NPA said inventories of new cars dropped about 20 pct from June to September. Inventories of new trucks also declined, although not to as great an extent as passenger cars. Auto manufacturers said that the industry has not only been able to sell all the cars it is currently producing, but is also steadily reducing dealers' stocks.

War Materials Leaking to China

Although U. S. trade with Communist China is "much better controlled" than it was a year ago, there still are "undesirably large quantities" of strategic goods moving from U. S.-controlled islands in the Pacific to Red China ports.

This charge was raised last week by a Senate subcommittee looking into leaks of strategic materials from American-controlled areas in the Pacific. Members said much contraband is moving through British Hong Kong and Portuguese Macao.

"In recent months, petroleum and nonferrous metal scrap, as well as military tires from U. S. bases, have gone in substantial quantities from these islands," the subcommittee said.

Rausch Named as Trouble-Shooter

Production bottlenecks will be the target of the Munitions Board's new special consultant and trouble-shooter, Raymond R. Rausch. Vice-president of Willys Overland Motors, Rausch has had lengthy experience in the automotive and electrical production fields.



STEEL DIRECTOR: Wallace B. Quail, on leave as Central Area manager for Armco Steel, is new director of NPA's Iron & Steel Div. He replaces Richard F. Sentner, of U. S. Steel Corp., in NPA's rotation system.

Industrial Briefs

A First—The first high-speed heat processing line for normalizing welded steel pipe continuously under automatic control will be built for the LONE STAR STEEL CO plant at Lone Star, Morris County, Tex., by Selas Corp. of America.

Syndicate Formed—A syndicate has been formed in the United Kingdom to survey sources abroad of sulfur in the hope that larger supplies can be made available to Britain and to world industry. To be known as the SULPHUR EXPLORATION SYNDICATE, it will include the big chemical companies in Great Britain.

Added Power — TENNESSEE VALLEY ASSN. has completed a new 44,000-volt power line from Hickory Valley, Tenn., to Holly Springs, Miss. The new transmission line will improve power service in northern Mississippi.

New Office—OLIVER IRON & STEEL CORP. has opened executive and sales offices of its Berry Div. in Pittsburgh. The division manufactures rotary power hydraulic pumps, motors, controls and transmissions.

Ground Broken—Expansion of power-driven brush manufacturing facilities of PITTSBURGH PLATE GLASS CO. was started when ground was broken for a new plant at Baltimore last week.

Buys Warehouse—Negotiations with the Erie R. R. whereby J. LEO COOKE WAREHOUSE CORP. will acquire an additional facility in Jersey City have been completed.

Appoints Distributors — Cleco Div., REED ROLLER BIT CO., Houston, has appointed Dawson MacDonald Co., Inc., Boston, and Louisville Mill Supply Co., Louisville, as distributors for Cleco products in those areas.

Steel Directory—A 1951 revision of the Directory of Iron and Steel Works of the United States and Canada has been completed by AMERICAN IRON & STEEL INSTITUTE. Revision is welcome because of vast changes in capacity since the directory was last revised in 1948.

To Open Plant—NATIONAL RADIATOR CO. will formally open its new sheet metal fabricating plant in Duncansville, Pa., on Oct. 18.

Buys Press—In support of its expansion of production facilities GLENN L. MARTIN CO. has purchased a 7000-ton hydraulic press to be used for low pressure, shallow metal forming by the Guerin process.

New Quarters — INTERSTATE STEEL CO. has occupied its new office and warehouse quarters at 2100 Greenwood St., Evanston, Ill.

Aro Purchases—Pyles Industries, Inc., Detroit, has been purchased by ARO EQUIPMENT CORP., Bryan, Ohio.

Big Birthday—A beautiful and interesting book is being mailed out this week by U. S. STEEL CORP. Called "Steel Serves the Nation," it commemorates the 50-year story of the Corporation—1901 to 1951.

Michigan Agents—The Day Co., dust control equipment manufacturers, has appointed R. DYKSTRA & CO., Detroit, as its engineering and sales agency for the Michigan territory.

New Building—NATIONAL BROACH & MACHINE CO. has occupied its recently completed building at Shoemaker and St. Jean Avenues, Detroit.

Contract Awarded — EICHLEAY CORP., Pittsburgh, has been awarded the contract for installations and alterations at the Portsmouth, Ohio, plant of Detroit Steel Corp.

Plant Leased—Manufacturers Foundry Co. building, Waterbury, Conn., has been leased by PRATT & WHITNEY. The facility will be used as a receiving center and transfer point for new machine tools bought in P&W's expansion program.

Elected Member — Oliver Smalley, president, MEEHANITE METAL CORP., New Rochelle, N. Y., has been elected an honorary life member of the Institute of British Foundrymen, London. Such memberships are conferred only in recognition of valuable services to the foundry industry over a long period of years.

Sells Cars—NEW HAVEN R. R. has announced the sale of 25 all-steel coaches to the Arabian American Oil Co., Saudi Arabia. Cars are now being readied for shipment.

Selling Agreement—Lea Manufacturing Co., Waterbury, Conn., will handle the sales of special polishing machinery throughout most of the country for CLAIR MANUFACTURING CO.

Consolidation—AMERICAN CYANAMID CO. has consolidated its several Los Angeles office and warehouse locations into one newly-constructed building at 2300 S. Eastern Ave.

Management Meeting—The annual conference on management techniques of the SOCIETY FOR THE ADVANCEMENT OF MANAGEMENT will be held Nov. 1-2, at the Hotel Statler, New York.

Miners Sign — Mining operators in Wisconsin, Michigan and South Dakota have signed ten government exploration contracts involving nearly \$1 million in the search for new reserves of critical minerals, under the Interior Dept.'s Defense Minerals Administration's financial assistance program.



ENGINEERING DEPARTMENTS

at MESTA

A section in one of the Mesta Engineering Departments, where machinery to fit individual requirements is designed and plans for complete plant projects are developed. These include not only designs for the mechanical equipment built by Mesta, but also for buildings, foundations, electrical distribution systems, and all the engineering that is required for the creation of a modern industrial plant.



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

The Automotive Assembly Line

Defense Could Upset Car Schedules

Defense comes first . . . Hope for million cars this quarter . . . Manpower shortage feared next year . . . Detroit gets into machine tool production picture—By Walter Patton.

No one can predict with certainty what future auto output will be. National defense developments may upset auto schedules at any time. The rule in Detroit today is that defense comes first.

However, most Detroit auto executives now feel that, barring unforeseen developments in the world situation and strikes at home, the industry will produce between 1,000,000 and 1,100,000 passenger cars during the fourth quarter. The first quarter of 1952 should see a million car turnout.

Missing Men—The key to future auto production schedules will be (1) available raw materials, (2) unemployed workers. If layoffs become too severe, auto schedules will be boosted—somehow. It will probably take 9 months to a year for the auto industry to get back workers already laid off—if they can be coaxed back.

Getting auto workers to take a job in a brand new defense plant is not always easy. Workers seem to prefer to remain in civilian jobs with better long-term prospects. Most Detroit observers see an acute manpower shortage developing here in 9 months to a year.

Power Steering—Hottest current item with auto engineers is power steering. The very favorable reception of Chrysler's power steering has sent auto engineers back to their drawing boards to find other ways to do the power steering job. The present Chrysler device, built by Gemmer, is a hydraulic mechanism.

However, some engineers feel this is only one of several possible methods to provide power-assisted

steering to the car owner. Other methods are being investigated.

Machine Tools—The automobile industry is moving steadily into the machine tool production picture. Help is being provided in two ways: Companies (like GM) which have the facilities will build complete machine tools to serve defense. Other auto firms will take on subassemblies and help on subcontracting.

Clay Bedford, former K-F executive, and Bill Boyer, GM production engineering chief, have had a prominent part in helping to break the tool bottleneck.

Ford Rebuilds—Ford has started an extensive program for rehabilitating and modernizing machine tools at its Dearborn



OUT OF MOTHBALLS: World War II fixtures and machines are reconditioned for the present emergency at a Ford Motor Co. plant. The aircraft engine mount shown here will then go after overhaul to the company's Chicago aircraft engine plant to help produce Pratt & Whitney B-36 engines.

plant. Many of the tools were put in mothballs by the Armed Forces at the end of World War II.

Under the plan Ford can get a special lathe ready for operation within 3 weeks. The same machine might require 15 months if ordered from regular machine tool channels.

Milling machines, special drill jigs and other equipment are being readied for operation. Many of these machines will be used to build Pratt and Whitney aircraft engines and to manufacture tanks.

Copper Cuts—As many observers feared, copper has become the auto industry's No. 1 headache. Auto firms are squeezing copper out of car specifications as rapidly as possible. One producer has cut 30 pct of the copper requirements for a radiator.

However, this is only a starter. Cutting out copper from a car is like pulling teeth. Calls on auto builders by their parts suppliers (who have run out of copper) are climbing steadily. This is the basis for the strong fear that copper will call the turn in auto production during the rest of '51.

High Steel—Cost of steel used to build automobiles is climbing sharply even though quoted steel prices supplied by the mills have not advanced. The growing importance of conversion steel has pushed steel costs—even with today's reduced auto volume—to the highest point in the postwar period. Conversion steel now accounts for 25 pct or more of the industry's total steel supply.

Face-Lifting—There will be 1952 model cars but most of them will be face-lifted models. Ford is making extensive body changes and so is Nash. GM and Chrysler changes will not be extensive but there will be the customary new model announcements.

Turn Page

OUTPUT: DPA Sees 1,100,000 Units

Figure for this quarter predicted by DPA's Fleischman . . . Tells of machine tool task force . . . New program plans use of automotive and related industries to build more tools.

Passenger car production at the rate of 1,100,000 units during the last quarter of this year was projected by Manly Fleischman, chief of Defense Production Administration and National Production Authority, in Detroit last week.

Mr. Fleischman addressed the Economic Club of Detroit at its regular monthly meeting.

He also announced that a task force has been set up in Washington under the direction of Clay P. Bedford, deputy administrator for procurement and production of DPA, and Franz Stone, assistant administrator of NPA, in charge of Industrial and Agricultural Equipment Bureau, to speed up machine tool production. Preliminary negotiations have already been concluded. Prime contracts and subcontracts will probably be consummated at an early date, Mr. Fleischman said.

Use Auto Facilities—The new machine tool program contemplates the use of facilities of the automotive and related industries in the expansion of the machine tool program. The plan was explained to top officials of the automobile, truck and tractor industries, labor representatives and officials of the Office of Defense Mobilization and NPA at a meeting in Washington last week.

The plan calls for actual building of machine tools by auto firms having necessary facilities. Fisher Body Div. of General Motors Corp., Ford Motor Co., and International Harvester Co. will build machine tools under agreement in their own plants. Other auto firms which do not have necessary facilities will take on machine tool subcontracts.

They will also assist machine

tool builders in subcontracting their work out to small business firms which may not be known to the machine tool industry. Mr. Fleischman admitted that cut-backs in passenger car production may result in temporary unemployment in the industry.

Pistons Deflate the Ego

Personal nomination for the engineer with the keenest sense of humor goes unquestionably to Stanwood W. Sparrow. Mr. Sparrow is Studebaker's vice-president in charge of engineering and a past president of SAE. His definition of a piston is a classic

which ought to be set up as a model for all engineers who would like to inject a little humor into their technical papers.

According to Mr. Sparrow an automobile piston is: "A hunk of metal essential to the operation of an internal combustion engine and created for the express purpose of preventing engineers from becoming conceited. It accomplishes its purpose by slapping or scoring whenever the piston problem appears to be solved."

K-F Calls Back Workers

Aircraft production is going forward at Willow Run and Kaiser-Frazer has recalled nearly all employees idled earlier this year. Production of subassemblies of Fairchild C-119 airplanes started several months ago.

K-F employment is expected to hit 20,000 by next summer. The number of workers at present is 11,000.

THE BULL OF THE WOODS

By J. R. Williams





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A medium size forging, illustrated above, is the top head for a 2,000 ton hydraulic press. It is made of C-1045 steel, normalized and drawn in one of Finkl's heat treating shops. Forged from a 59" ingot, the rough machined forging shown weighs 22,800 pounds. Whether carbon or alloy steel, the Finkl organization can easily handle any job from a few pounds up to 50,000 pounds apiece.

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West Coast Report

Harvey Denies Power Shortage

New plant would not affect present load . . . Politics, finance main problems . . . Yolo Steel seeks tax write-off . . . Mathesius retirement rumored—By R. T. Reinhardt.

Power, politics and money continue to smog up the future of aluminum production in the West.

Harvey Machine Co. at Torrance, Calif., headed by Leo Harvey, last week maintained there was no substance to the report that their proposed aluminum reduction plant at Kalispell, Mont., would not be built because of the lack of electric power. This makes sense since the present power shortage in the Bonneville Power Administration grid is strictly seasonal. (See p. 57.)

BPA, even though a government agency, is definitely in the business of selling all available power, and analyzes and forecasts its potentials with a marked degree of accuracy. Recently when THE IRON AGE discussed allocations of power with the Administration's load forecasters, it was very evident that a block of interruptible power had been set aside for the proposed Harvey plant.

Politics, Finance—This power, initially, was to come from Hungry Horse Dam and would have no effect on the present load. No firm power had been guaranteed to Harvey until completion of Hungry Horse, in early 1954. Even with energetic and emergency efforts, the Harvey plant at Kalispell would not be an important load factor for at least another year.

Hence, it is not unreasonable to believe that availability of electric power will not be the determining factor in constructing the plant. It seems more reasonable to believe that any delay in the start of construction at Kalispell can be laid at the door of politics or finance.

Production Cut—Aluminum production in the Pacific Northwest has already been seriously curtailed, as was predicted several months ago. However, this situation has no bearing on the proposed Harvey plant in Montana.

Perhaps the well-organized and militant group of Pacific Northwest industrialists who have continually opposed further primary aluminum production in that area are getting in their licks.

Won't Give Up—Even if pig is never poured from a blast furnace in central California, the promoters of Yolo Steel Co. have given major producers in the West something to think about.

Early this year the promoters of Yolo Steel and Metal Corp. startled the steel producing industry of the West by announcing a plan for a \$264 million steel plant in Central California.

Promoters are still attempting to get a Certificate of Necessity from NPA. They claim to have



control of 2½ million tons of 55 pct or better iron ore in the Minarets Deposit in Madera County and 7 or 8 million tons of 36 pct Fe in Shasta County.

New Plants—Avowed intent is to build a beneficiation plant some place between the two deposits and ship the concentrate to a 250,000-ton-per-year blast furnace in Yolo County.

Coal reportedly will be obtained from Wyoming and delivered to the blast furnace for approximately \$8 per ton.

United States Bureau of Mines has drilled the Minarets Deposit, which lies approximately 10,000 feet altitude in the Sierra Mountains, and published a report substantiating Yolo's estimates. The Shasta deposits have long been recognized as to extent and quality but their commercial value aside from ship ballast has been open to question.

Political support for the sought Certificate of Necessity has wavered and at the moment is in the balance.

Coming Events—For several months the steel industry of the West has been aware of the fact that Walther Mathesius, president and "father of the Geneva Steel Co.," is soon to retire, even though official announcement may be a few weeks away.

In the trade there is considerable conjecture as to his successor and the effect his retirement will have on the over-all policy in the West of the U. S. Steel Corp.

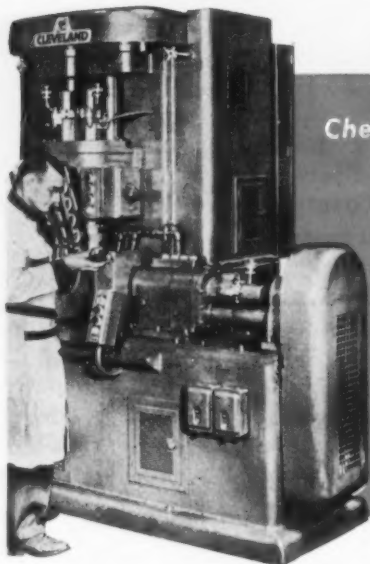
Smart observers believe that on retirement of Dr. Mathesius, U. S. Steel will consolidate its western operations in Utah and California.

More Screws—Filling an obvious need in southern California, Cherry Rivet Co. of Los Angeles is expanding its facilities to make sheet metal and wood screws and hopes to be in operation early in 1952.

CLEVELAND tapping machines

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screw

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Machine Tool High Spots

What's Behind Shortages of Tools?

Builders were in slump before mobilization . . . Prices low, finances down . . . Skilled labor flees, hard to get back . . . Washington bungling stalls recovery—By George Elwers.

Behind the obvious shortages of men, materials, and components are deeper reasons for the lag of machine tool production behind Washington goals.

An important factor has been the industry's slow start. The industry was set for World War II production through orders from Europe. Production was on the upswing by the time the U. S. buildup got under way.

Bad Slump—But when Korea hit, the machine tool industry was in a bad slump. Labor forces and inventories had been pared to the bone. A depressed market had kept prices down, in many cases below cost. Finances were low.

Of primary importance right now is the fact that skilled labor had been lost. The simultaneous expansion of all defense production after Korea made it difficult to get these lost men back. And high-paying new defense plants in many areas actually took more men away.

Must Stop There—A good example is a Midwest machine tool-maker who employed about 6000 workers during his peak wartime production period. When Korea hit he was down to about 1200. He has by now been able to build his force up to around 2000 workers, but sees no prospect of being able to substantially raise this figure to meet needs.

Wage Rise?—The Warner & Swasey Company last week took a swing at its manpower problem by asking Washington for permission to raise its wages 10¢ an hr. Defense Mobilizer Wilson has told the Wage Stabilization Board to

approve over-ceiling wages where necessary to help machine tool builders attract workers. Many machine tool builders doubt if increased wages will help much but will watch Warner & Swasey's effort closely.

Money, too, has been an important factor in the machine tool industry's slow start. Korea found the industry's finances very low—too low to easily bear the burden of financing suddenly increased inventories, to say nothing of paying for plant expansion.

Legal Stumbling—Some incredible mistakes in Washington contributed to this problem. One of these was the freezing of prices at levels in effect on machines being delivered, rather than those being quoted, during the freeze period. Another was a joker in the regulations on government-guaranteed loans to defense industries. Another was the lack of



advance payment accompanying pool orders.

Most of these fiscal blocks have now been removed or at least reduced. But valuable months were wasted before this was done.

Subcontracting Suicide—Washington confidently expects huge machine tool production increases through subcontracting. But until recently, the nature of price controls made it financial suicide for machine tool builders to subcontract extensively. Now they can pass these high costs along, but valuable months have been wasted.

Monarch Expands—The Air Force wants a lot of T-bed lathes for finishing jet engine rings and rotor wheels. Pool orders for about 2000 such lathes are soon to be awarded. The Monarch Machine Tool Co. has already received notice that it will be asked to build several hundred of these machines.

This huge order, on top of its already record-breaking backlog, has prompted Monarch to begin its second plant expansion within a year. With a plant addition of some 40,000 sq ft nearing completion, another slightly larger addition is being started.

Monarch emphasizes that these additions are not strictly "war babies." The firm's growth has been steady, and these new facilities would have been needed, and had been planned, anyway. But the expansion timetable has been accelerated by the war.

Backlogs Rise—Data being received by the National Machine Tool Builders' Assn. indicate that large machine tool backlogs continued their unbroken rise in August. New orders received totaled about 5 pct higher than in July.

Shipments bounced back about 15 pct from the July dip. But the ratio of unfilled orders to shipments rose again.

SPRING WIRE

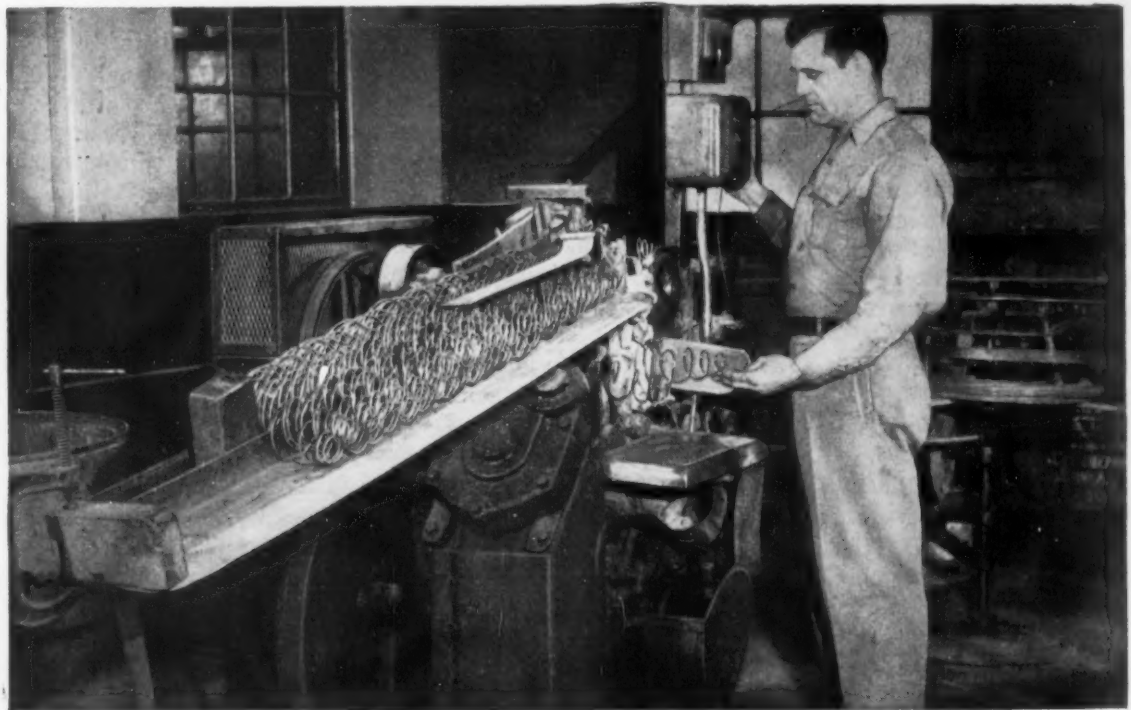
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highest uniform quality at all times. From end to end, Roebling Spring Wire is identical in gauge and finish, in mechanical and metallurgical properties . . . saves preparation time for users . . . brings faster, smoother production.

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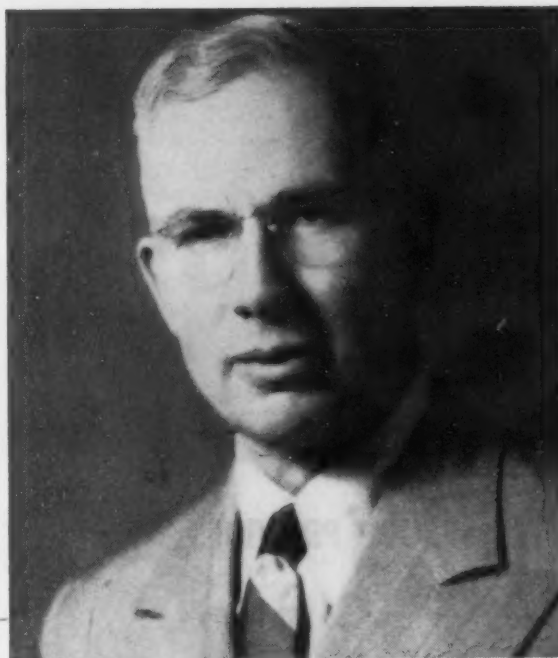


The **Iron Age**

SALUTES

Clay P. Bedford

Enthusiasm and a sense of humor have won Clay Bedford a host of friends . . . He's built dams and ships and autos. Now he'll break bottlenecks in the arms program.



CLAY P. BEDFORD, executive vice-president of Kaiser-Frazer Corp., has spent most of his working life figuring out how to break production bottlenecks. Now, as assistant to Charles E. Wilson, he has his biggest assignment.

To his many friends and admirers, Clay is an outstanding example of a straight-thinking, straight-talking, quick-acting executive. He keeps his equilibrium and sense of humor under the most trying circumstances.

Clay "gets along" with people. His enthusiasm is contagious. He believes good human relations come first in any project.

Steelmen know Clay from the days he was knocking on their doors for steel to run the Kaiser-Frazer auto plant at Willow Run. They had doubts at first but they learned to respect this man. And some of these same steelmen later became his best friends.

Clay started as a draftsman on a Kaiser construction project. He managed pipelines, was later transportation superintendent for companies associated with Kaiser in building Boulder Dam.

He went on to be construction chief on the Grand Coulee Dam. As vice-president and general manager of Kaiser shipyards, he directed the efforts of 90,000 people during World War II.

If hard work, personal leadership and a determination to overcome all obstacles will do the job Clay Bedford has ahead in Washington, Charlie Wilson has picked a winner for his first assistant.

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Its resistance to wear, as machined, is sufficient to replace many heat-treated or carburized steels.

3. Minimizes Warpage

Because it is *stress-relieved*, this superior bar assures the user a minimum of distortion.

4. Speeds Up Machining

Has *in-the-bar* machinability fully 50% better than heat-treated alloys of the same hardness.



Many companies are realizing important savings by using Ground and Polished STRESSPROOF bars instead of grinding the steel in their own shop. For this superior steel provides precision tolerances at a reasonable cost, without tying up valuable labor and machinery.

This all-purpose bar stock is ground to close tolerance and highly polished at the LaSalle plant on batteries of modern machines — at lower cost than you can grind it yourself. Furthermore, because this versatile steel is stress-relieved, it requires no straightening after keyseating, journaling, threading, or other machining operations. And its four qualities *in-the-bar* eliminate many other costly operations.

Almost all of today's Ground and Polished STRESSPROOF production is going into defense jobs. However, from time to time, some sizes of sample bars may be available for testing purposes.

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Polished and Ground and Polished Bars,
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The *Iron Age*

INTRODUCES

Arthur J. Wieland, elected a vice-president of FORD MOTOR CO., Dearborn.

A. D. Engle, appointed assistant vice-president for research for the AUSTIN CO., Cleveland.

S. A. Angotti, appointed assistant secretary of LANDIS TOOL CO., Waynesboro, Pa.

H. F. Pietsch, appointed assistant chief metallurgist and inspector; H. J. Wolthorn, chief chemist; J. O. Mack, chief control and development metallurgist; D. T. Goettge, chief sheet mill metallurgist and inspector; and R. V. Cordingley, chief tin mill metallurgist and inspector, of the Metallurgical and Inspection Dept. of the Fairless Works of U. S. STEEL CO., Morrisville, Pa.

Gerry E. Lyons, named general sales manager for WILLYS - OVERLAND MOTORS, INC., Toledo.

Lawrence Wilkinson and E. R. Van Meter, elected vice-presidents of CONTINENTAL CAN CO., INC., New York.

Frank P. Minnelli, appointed manager of the Market Research Dept. of YALE & TOWNE MFG. CO., Philadelphia Div., Philadelphia.

Herbert G. Weightman, becomes head of the PROGRESSIVE WELDER SALES CO. OF CALIFORNIA, Burbank, Calif.

Leon R. Steffen, named director of purchases for AC Spark Plug Div. of GENERAL MOTORS CORP., Detroit, succeeding Herbert R. Wells, who is retiring.

Paul W. Arnold, promoted to executive assistant to the sales vice-president of RELIANCE ELECTRIC & ENGINEERING CO., Cleveland. Richard A. Geuder, appointed manager of applied engineering and industry sales.

Ray G. Boyd, appointed general product sales manager of KAISER ALUMINUM & CHEMICAL SALES, INC., Oakland, Calif. G. P. Oldham, made general marketing manager and J. W. Watson, Jr., West Coast manager.

John E. Groves, appointed director of industrial relations and Ralph L. Ostrander, manager of labor relations, of ALLEGHENY LUDLUM STEEL CORP., Pittsburgh.

Jeff Coats, appointed sales personnel division manager of U. S. STEEL SUPPLY CO., Chicago.

J. P. Doan, named superintendent of extrusion operations, Magnesium Dept., Madison Div. of the DOW CHEMICAL CO., Midland, Mich. John M. Henske, made assistant superintendent of the Magnesium Dept. rolling mill and Herbert A. Clouet, maintenance superintendent, Madison Div.

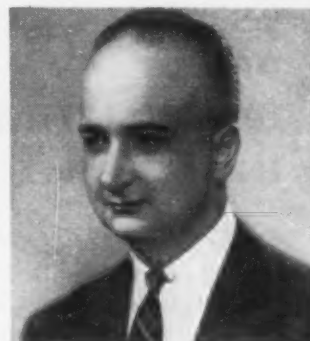
Herbert F. Miller, appointed general superintendent of MARION MALLEABLE IRON WORKS, Marion, Ind. Albert E. Salatka, made works manager.

C. W. Miller, named manager of large power transformer engineering for the Transformer Div. of WESTINGHOUSE ELECTRIC CORP., Pittsburgh. Thomas E. Stapleton, becomes district finance representative for the Eastern district.

Turn Page



WILBUR E. LUNGER, elected vice-president, American Car & Foundry Co., New York.



ARA A. CAMBERE, elected vice-president, Oliver Iron & Steel Corp., Pittsburgh.

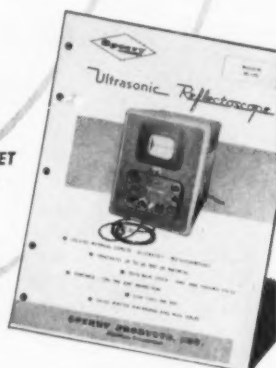


EADS JOHNSON, JR., appointed executive vice-president of Southern Wheel Div., American Brake Shoe Co., New York.

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LITERATURE ON REQUEST

Personnel

Continued

Frank H. Webster, appointed assistant manager, Western Div. of the Hyatt Bearings Div. of GENERAL MOTORS CORP., Harrison, N. J.

Don Balfour, made factory manager of TEXAS ENGINEERING & MFG. CO., INC., Dallas, succeeding O. E. Witbeck, who resigned.

M. P. Kartalia, appointed manager of merchandise sales of SQUARE D CO., Detroit.

Franklin B. Rote, appointed manufacturing control manager of ALBION MALLEABLE IRON CO., Albion, Mich.

H. A. Ferris, appointed manager of Western Div. of CANADIAN AVIATION ELECTRONICS, LTD., Montreal.

Robert H. Shoemaker, elected vice-president of KOLENE CORP., Detroit.

Riley R. Clark, appointed superintendent of industrial relations of South Chicago Works, U. S. STEEL CO., Chicago.

C. L. Van Derau, becomes general works manager in charge of the Mansfield and Columbus plants of WESTINGHOUSE ELECTRIC CORP., Pittsburgh. E. L. Smith, made works manager at Columbus; C. D. Heaton, manager of manufacturing at Columbus; and John B. Roman, works engineer at Columbus. Coleman London, made manager of electronics service of the Electronics and X-Ray Div. Robert R. Longwell, appointed Baltimore engineering and service manager, and George E. Grosser, district consulting and application engineering supervisor, with headquarters at Philadelphia.

Nels Grashaw and Jack Urban, appointed sales engineers by HARVEY TOOL SERVICE, Cleveland.

Wilber C. Nordstrom, appointed general manager of West Coast Div. of STANDARD PRODUCTS CO., Long Beach, Calif.

F. O. Spence, appointed regional sales manager of the DIVERSEY CORP., Chicago. R. C. Perry, made Pacific Div. manager.

B. M. Laney, joined KAISER-FRAZER CORP., Willow Run, Mich.



JOHN MENZ, appointed general sales manager—direct sales, Kaiser Aluminum & Chemical Sales, Inc., Oakland, Calif.



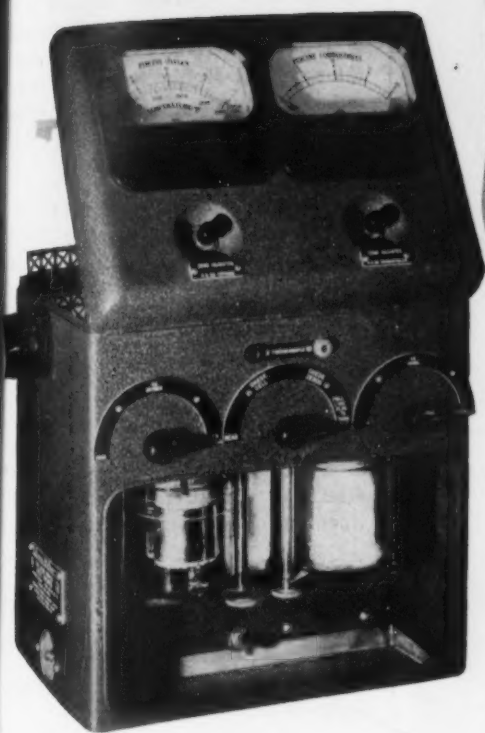
WARDEN F. WILSON, elected president and general manager, Donegal Mfg. Corp., Marietta, Pa.



FREDERIC B. POWERS, appointed president, Rawlplug Co., Inc., New York.



KENNETH G. HUBACH, appointed manager of Commercial Weldment Dept., Baldwin - Lima - Hamilton Corp., Eddystone, Pa.



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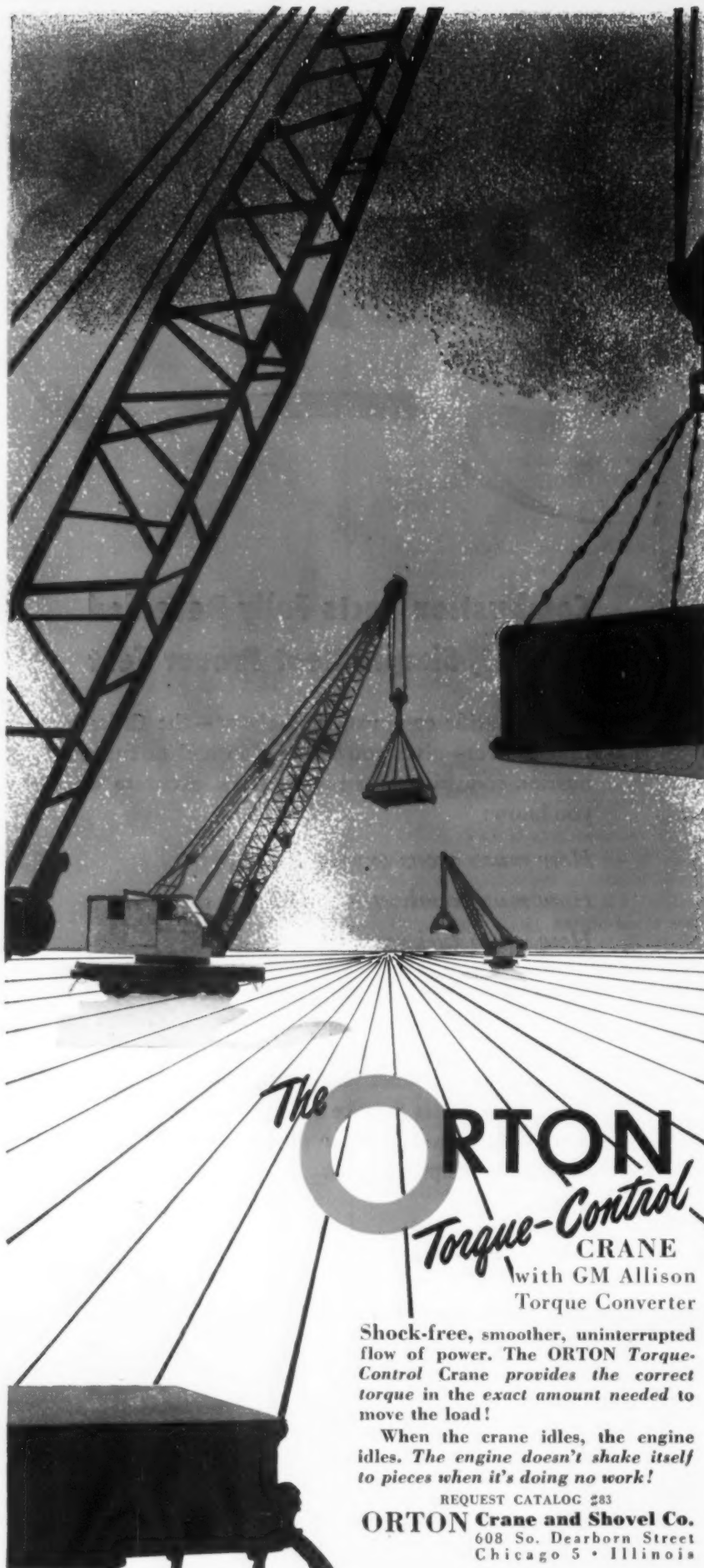
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Shock-free, smoother, uninterrupted flow of power. The ORTON Torque-Control Crane provides the correct torque in the exact amount needed to move the load!

When the crane idles, the engine idles. The engine doesn't shake itself to pieces when it's doing no work!

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Personnel

Continued

E. W. Beall, Jr., appointed Savannah district manager of SOUTHERN STATES IRON ROOFING CO., Savannah, Ga. E. O. Withington, becomes Columbia, S. C., branch manager; C. T. Brisbois, Albany branch manager; B. E. Shea, director of Savannah operations; N. B. Heflin, Savannah branch manager; and A. M. Bellsnyder, assistant manager of the Birmingham plant.

John A. Shaw, promoted to assistant manager, development of SPEER CARBON CO., St. Marys, Pa. Frederick A. Stephens, made development engineer, metallurgical section, and Herbert A. Ridgway, development engineer, electric furnace products.

J. Peter Brehm, named district sales representative in the San Francisco area for Woven Wire Fabrics Div. of JOHN A. ROEBLING'S SONS CO., Roebing, N. J.

Manley S. Hutchinson, made in charge of the East Coast Div. of MONARCH ALUMINUM CO., Cleveland. Jack Schriener, transferred to the Western New York-Northwest Pennsylvania territory sales.

W. L. Rusch, promoted to assistant sales manager of McCULLOCH MOTORS CORP., Los Angeles.

James R. Elsinger, transferred to the Baltimore district of SIGNODE STEEL STRAPPING CO., Chicago.

OBITUARIES

Charles S. Amadon, 57, owner and general manager of Connecticut Broach & Machine Co., New London, Conn.

Patrick McDonough, 63, president of the McDonough Steel Corp., Oakland, Calif., in Auckland, New Zealand.

Harry W. Benton, 67, plant engineer of Niles-Bement-Pond Co., West Hartford, Conn.

Louis A. Gilmer, 48, chief engineer of the Oliver Corp., Chicago.

Victor A. Menaglia, 57, district manager of SKF Industries, Inc., Pittsburgh.

L. B. Brent McGrew, assistant general manager and a director of William & Co., Pittsburgh. Mr. McGrew had been with the company for 35 years.

MAGNESIUM

impact extruded



By T. L. Patton
Process Development Div.
Dow Chemical Co.
Midland, Mich.

Magnesium is being successfully impact extruded by Dow Chemical Co. Present use is mainly for dry cell cases, but many other uses are expected to be found. Light, rigid, oil and chemical resistant, magnesium can be impact extruded in round, oblong, or rectangular shapes, with ribs, flanges, or bosses. Slugs have been made from bar, powder, hot metal.

Work done by Dow Chemical Co. as a part of its program to work out fabrication methods for magnesium indicates that impact extrusion will become an important fabrication method, to rank with drawing, forging, and spinning.

The process for magnesium impact extrusions is basically the same as for other metals, the main difference being the temperature of operation which in the case of magnesium alloys may vary from 350° to 700°F depending on the alloy and the speed of operation.

So far, most parts made have been of the type used in dry cell batteries—one of the promising uses for magnesium. Mainly they are round cans in diameters from about 7/16 to 1 1/4 in. and from 1 to 6 in. in height. Some square cans have been made and there is no reason to believe that parts having flanges, ribs, and bosses, could not be made.

Though they have not yet been made of mag-

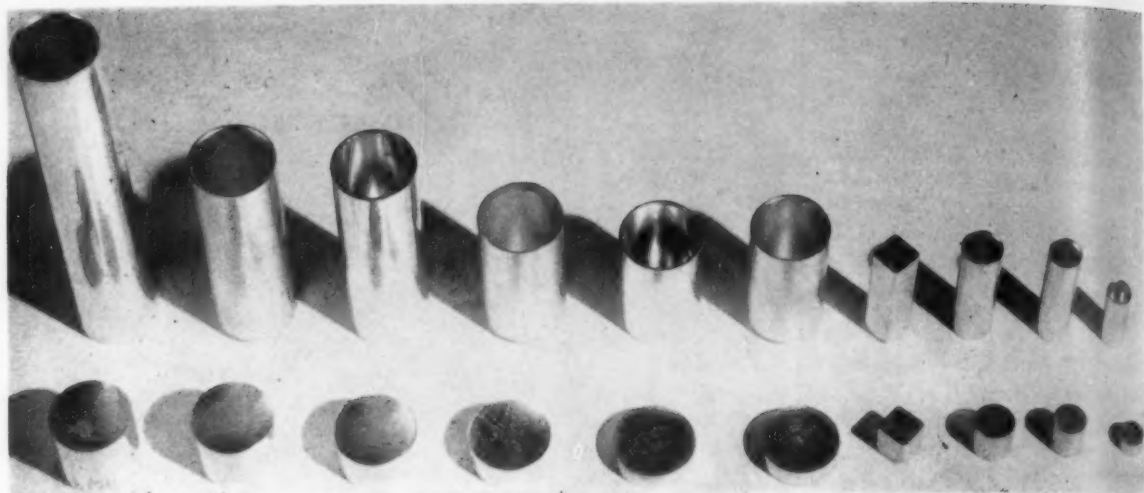
nesium, impact extrusion has been used to make parts such as collapsible tubes, shields for electronic devices, shell cases, parts for electronic coils, oil filters, flashlight cases, lipstick tubes, cigarette lighter cases, and many others.

Some of the advantages of impact extrusion for making these deep formed parts are listed in the accompanying box.

Some of the advantages of magnesium which bear consideration when looking for impact extrusion applications are the light weight—a third lighter than aluminum, their rigidity which means that parts can be rough-handled right from the extrusion press without damage, excellent resistance to many organic chemicals and oils, and excellent electrical conductivity.

The magnesium impact extrusion process consists of four operations: Slug preparation, impact extrusion, can trimming, and can cleaning.

Several types of slugs have been used for impact extruding magnesium parts. Examples are:



TYPICAL MAGNESIUM impact extrusions. In front of each piece is a slug of the size from which piece was made.

Magnesium impact extruded (continued)

Cast slugs, powder compact slugs, extruded bar slugs, and plate slugs. Slugs have been made by parting on a lathe or screw machine, sawing from bar stock, casting, shearing from plate and bar, and from powder.

A simple cutoff saw, equipped with a pneumatically-operated bar feed and air motors to make the saw automatic, is now being used to cut slugs at a rate of 30 to 60 per min. The low cost of this machine makes the sawing operation economical and practical where low production runs are involved.

Dry sawing is performed at a peripheral speed of about 2000 fpm using a high speed steel triple-chip saw blade having a pitch of about $\frac{1}{2}$ the rod diameter being cut. Saw life has not been determined, but 50,000 cuts have been made on 0.610 in. diam rod without excessive dulling of teeth.

The usual practice of using sharp tools and simple good housekeeping should be followed as in other magnesium machining operations. Saw chips should be kept dry and never allowed to accumulate around the equipment.

The sawed slugs are usually tumbled for about 20 min to remove sharp edges and any kerf. A clean smooth cut is obtained from sawing, but it has not been determined what effect the sharp edges have on die life and quality of parts. If no appreciable difference is noted on future runs, this operation will be discontinued.

The slug must be centered in the die cavity to make parts of uniform wall thickness. If too much clearance between the slug and the die is allowed, the slug may be placed in the die cavity off-center, allowing a greater metal flow on one side of the punch. If the punch has any tendency to bend, it will do so.

Therefore, the slug diameter should be as close to the die diameter as possible. The rate at which the slugs must be fed to the die cavity may

control the allowable difference in slug and die diameters, but in most cases 0.010 in. at the operating temperature is allowed on magnesium slugs. In some cases it may be necessary to use preformed or pierced slugs to help center the punch—the method is generally used on collapsible tubes.

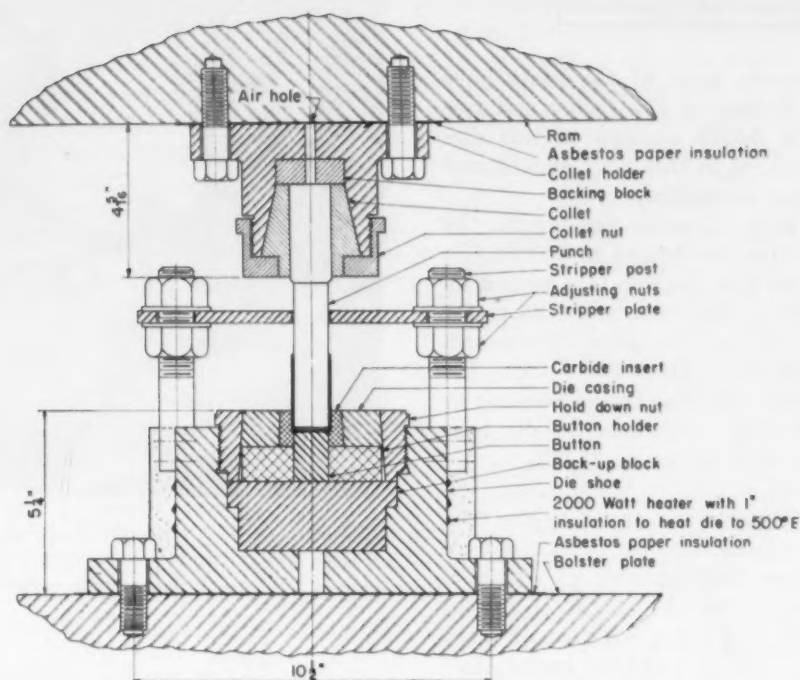
Lubricant is applied to the slugs by tumbling. Several graphite dispersions have been used, but Acheson Colloids Dag No. 41 has been outstanding. This material has been used as purchased at a rate as low as 1 cc per 100 sq in. of slug surface on slugs $1\frac{1}{4}$ in. in diam and 0.690 in. thick, to be impact extruded in a carbide die. On a production job, 2000 slugs 0.429 in. in diam and 0.275 in. thick are uniformly coated by tumbling about 10 min with only 10 cc of lubricant added to the slugs.

Lubricant sprayed on

The lubricant film must be controlled for good quality parts. Too much or too little lubricant will cause poor quality parts, either because of graphite building up in the die cavity or because the magnesium adheres to the die cavity surfaces with subsequent scoring of parts. If the lubricant film is uneven or left off part of the slug, a product with non-uniform wall thickness will result because of non-uniform flow of metal. In addition to this defect, the can surface made from the unlubricated slug will have small checking or cracking similar to a cold short type of surface.

Other methods of lubrication which have been used successfully are spraying the lubricant in the die or spraying the heated slugs. Here the colloidal graphite is usually thinned with 5 to 10 parts of kerosene to one part of the concentrate. These methods are too slow for high speed automatic operation. A thin, even lubricant film has never been attained by dipping slugs.

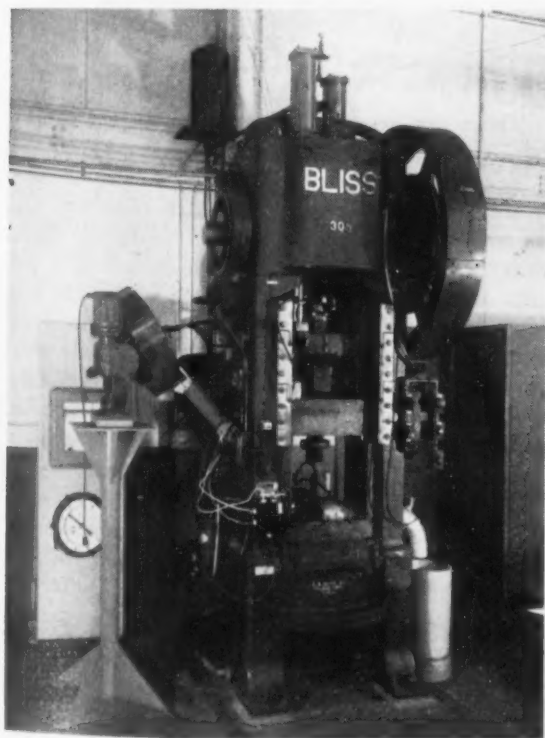
If the slugs are roughly handled the lubricated slugs should be baked for 30 min at 800°F to



TOOLING for production of a typical magnesium impact extrusion. In this setup, a 3-piece carbide die is used.

increase the adhesion of the lubricant to the magnesium surface.

It may also be necessary to clean the slugs by pickling prior to applying the lubricant film if the rod or slugs have oxidized or picked up oil,



PRESS SETUP for automatic production of magnesium impact extrusions. Feed device on column at left feeds slugs down heated track to die. Automatic stripper discharges finished parts into container set up at right of press.

dirt, or other foreign matter. Cleaning may be done as outlined in the box.

A corrosion problem arises when graphite is applied to magnesium; therefore, slugs should not be coated and allowed to stand around unless they are stored in closed containers. It is best to lubricate the slugs just prior to the impact extrusion operation.

Presses of the horizontal or vertical, mechanical or hydraulic types may be used for the impact extrusion operation. Some presses may hold certain advantages over others, but in general any sturdy, well-guided press having sufficient capacity and stroke is acceptable. Horizontal presses may provide easier feeding and ejection of parts, but the slide ways wear faster than on a vertical press. On good equipment wall thickness variation may easily be held to ± 10 pct of the nominal wall thickness. Closer tolerance may be held by more careful alignment of tools, short punches, perfect alignment of the press ram, low clearances between slug and die, and proper slug lubrication.

When a small number of parts is to be made, hand feeding may be desirable, but for high production runs, special equipment is used. This consists of a hopper, heated feed track, and transfer mechanism for making parts at 75 per min. The upper limit at which parts can be made has not been reached as far as extrudability of parts is concerned. Some parts have been made on presses operating at 100 strokes per min. The limiting factor would appear to be a suitable feeding mechanism rather than the press speed.

Magnesium impact extrusions have been made from all of the commercial alloys and from pure

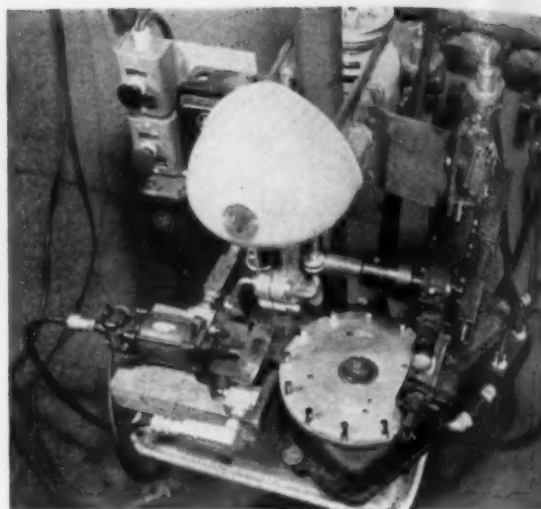
magnesium. However, most of the parts have been made from Dowmetal FS-1 alloy and recommendations and details covered in this discussion will be confined to this alloy and limited to parts of the type illustrated.

When feeding 10 to 15 parts per minute, the slugs and the die shoe are heated to 500°F. The only heat applied to the punch is that picked up during the operation. Optimum temperature for continuous operation has not been determined, but it is somewhat lower than 500°F since the die will take on some heat due to the working of the metal. Under some conditions the die temperature has been held as low as 350°F.

The slug is heated as it slides through the feed track. A tubular heater, through which the feed track passes, is made by winding Nichrome wire on an Alundum core and applying an Alundum refractory cement followed by a coat of insulation. The excellent thermal properties of magnesium permits the use of a smaller heater than would be required in steel or zinc.

Other conventional methods of heating, for example by high frequency induction or direct flame, could be used. For small orders the parts are heated on a platen heater and transferred to the die cavity with tongs.

The pressure required for magnesium impact extrusions varies with temperature, reduction in area of part, alloy, and lubricant used. A pressure of 40 to 45 tons per sq in. is required to impact extrude FS alloy with a reduction in area of 85 pct. The pressure drops considerably as the operating temperature is increased to 700°F, but the tendency for die loading and scoring of parts increases. The pressure does not change considerably for reductions in area below 85 pct, but above this amount, especially above reduc-



SEMI-AUTOMATIC setup for trimming impact extrusions. A lathe type cutting tool is mounted in a drill press spindle. Loaded by hand, fixture unloads automatically.

tions in area of 90 pct, the pressure increases very rapidly.

There are indications that the lubricant used may cause a variation in the load required although this has not yet been studied in detail. The shape of the slug may also cause some variations in load. For instance, a square slug will require slightly less pressure to extrude than a round slug when a round cavity die is used. However, lubrication and die wear problems are more severe when using square slugs than when using round slugs in a round cavity die.

Die design varies

There are many different ideas on the proper punch design among impact extrusion men. The punch in the drawing has the shank ground about 0.005 in. less in diameter than the nib diameter. Some tool designers prefer a slight relief at the extreme end of the punch with the rest of the shank the same diameter as the nib to permit resharpenering of the punch and hence longer tool life. A slight bevel, about 20°, is used at the outer edge of the punch nib to facilitate metal flow. The punch must have backing or support to prevent it from rocking in its holder.

The punch steel material used contains 5 pct Cr, 1.5 pct Mo, 1.25 pct W, 1 pct Si, and 0.35 pct C, and is hardened to a 55-60 RC. Punch life depends upon the allowable tolerances, but in general about 200,000 parts can be made before a punch must be reworked or replaced. The punch can always be reground and used on a smaller size part having the same shape. The slenderness ratio, punch length divided by punch diameter, is an important factor in determining the size of part that can be made. A slenderness ratio above 8 to 1 is not recommended, because the tendency for the punch to wander and make eccentric products increases above this ratio.

SLUG CLEANING PROCEDURE

Step 1	
10 min at 180 to 200° F in bath composed of:	
	Grams per liter
NaOH	90.0/1
Na ₂ PO ₄ ·12H ₂ O	10.0
Na ₂ SO ₄	5.0
Dupanol M. E. wetting agent	0.5
Water to make one liter	
Step 2	
1 min in bath composed of:	
CrO ₃	180.0
NaNO ₃	30.0
CaF ₂	1.0
Water to make one liter	

IMPACT EXTRUSION ADVANTAGES

1. Tooling is relatively cheap.
2. Production rates are high.
3. Parts can be made in one step, as compared with several steps required when deep drawing.
4. Bottom can be made thick, while walls are thin.
5. Ribs, flanges, and bosses may be incorporated.

The dies being used have been one piece dies made of the same tool steel as the punches, and three-piece carbide dies. The carbide dies are favored because of the longer life and higher quality parts they produce. The surface quality of parts is better when a carbide die is used because the die cavity surface resists the welding of the magnesium to the die cavity side walls. The tool steel dies have a life estimated at 200,000 parts while the carbide die life is expected to be about 10 million parts.

Part easily stripped

The die cavity is machined with a 0.002 in. per in. of cavity depth taper on the die diameter to prevent parts from sticking in the die cavity. By allowing the part to remain on the punch it is lifted from the die cavity and may easily be stripped off the punch mechanically and blown out of the press into a tote box. The part is, however, made with a slight taper in wall thickness. If this cannot be tolerated, the die slide walls would have to be made straight causing parts to remain in the die. Then a bottom knockout would be needed.

The depth of the die cavity is determined by the slug size. A small entering radius, about 1/32 in., is machined at the top of the die cavity. The bottom of the die is made flat and the corner radius is usually about 1/32 to 1/16 in. which will produce a part which is practically square on the bottom. The slug must not project above the die cavity unless it is desired to have a

thick rim or flange around the top of the finished part. The bottom thickness tolerance is ± 0.005 in.

In starting up with a cold punch the expansion of the punch due to heating up must be considered in holding tolerance. The die diameter is made 0.008 in. per in. larger than the desired finished part dimension to account for expansion and contraction of magnesium when operating at 500°F. The punch diameter is made only 0.004 in. per in. larger than the desired finished part dimension.

Parts may be made to the proper length without trimming if the slug contains exactly the correct volume of metal for the finished part and if a length tolerance of $\pm 1/32$ in. is allowable. If the parts must be trimmed to size, a fly cutter may be used and the parts trimmed in a drill press at high rates of speed. A conventional knife cutoff may also be used.

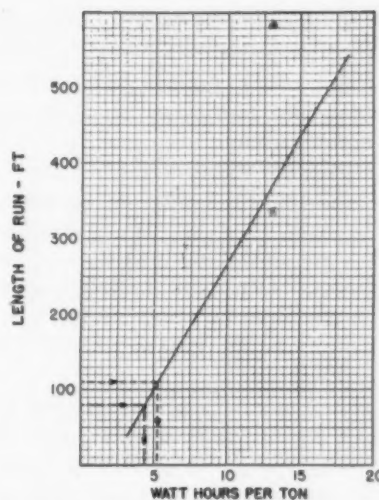
Graphite is cleaned off the product in a three-step process. First is a 15 min. caustic soak, the same as for slug cleaning, followed by a thorough rinse in cold running water. Next an acetic nitrate pickle allowing enough time in the bath to remove about 0.001 in. of metal per surface. The bath composition is 40 pct acetic acid, 5 pct sodium nitrate, remainder water. This is followed by thorough rinsing in cold running water. Finally comes one min. in a bright pickle solution, the same as used for slug cleaning, followed by a thorough rinse in cold running water, then a hot water rinse to facilitate drying, and thorough drying at 300°F. This treatment is not used when the surface is painted.

Figure your own electric truck power requirements

A new estimating method makes it possible to determine industrial truck storage battery capacity for any given work period. Under-capacity batteries which run down before the end of a shift and too-large units with high initial costs are eliminated.

The accompanying graph is used to determine the watt-hour per ton required to move a loaded truck over a level run. To illustrate the procedure involved, a 3650-lb truck, 2000-lb load, 3-ft average lift, 110-ft average level haul and 30-ft, 10-pct grade is assumed. By following dotted lines in graph, 5.4 whr are required to haul 1 ton 110 ft. Weight of truck plus load is 2.825 tons, so 15.25 whr are required.

Power required for the 30-ft grade is determined by means of a formula, as follows: 2.825 tons (truck plus load) X 30 (length of grade) X 0.10 (grade, pct) X 0.013 (a constant) = 0.11 whr (extra power required for grade). To calculate power consumption for the return trip with an empty truck, the length of the grade is deducted from the level distance, leaving 80 ft. The graph's dashed lines indicate that 4.4 whr



WATT-HOURS per ton required to operate electric industrial lift trucks over level concrete.

per ton are required, or for the present example, 8.03 whr. Formulas of watt-hours required for lifting and tilting the mast can be secured from "Handbook of Material Handling," Electrical Industrial Truck Assn.

EMBRITTLEMENT of Tempered Martensite Better Defined



By P. Payson

Asst. Director of Research
Research Laboratory
Crucible Steel Co. of America
Harrison, N. J.

"Blue brittleness" pertains to low alloy ferrite and should not be confused with "temper brittleness." Three new designations are proposed to eliminate the confusion in present terminology. The third factor not yet simply defined might better be called "Hard Tempered Martensite Brittleness."

There is a minimum in the notch-impact versus tempering-temperature curve of hardened steel at about 600°F temper. This phenomenon unfortunately has sometimes been referred to as "temper embrittlement," and sometimes even as "blue brittleness." These terms are confused one with the other because different phenomena are involved in each. The only thing common to all three is the metallurgists' ignorance of the exact cause of each. Although descriptions of these phenomena are easy to locate in the literature¹, it might be helpful to point out the distinct differences among them.

"Blue brittleness"² is a phenomenon that has been known for a much longer time than the other two. It applies primarily to annealed or normalized low carbon steel of practically no alloy content. When this type of steel is strained at about 500° to 600°F (the temperature at which a polished surface of steel develops a blue oxide film) and then tested at room temperature, it is more brittle than it would be if it were strained the same amount at room temperature. Furthermore, this type of steel when tested for tensile properties at elevated temperatures shows

a maximum in tensile strength and a minimum in ductility at about 500° to 600°F. Since this type of steel consists of ferrite, with varying amounts of pearlite, it can be concluded that "blue brittleness" is a phenomenon peculiar to low alloy ferrite.

"Temper brittleness" was first observed during World War I. It has been widely discussed both here and abroad, but a complete explanation of it has not yet been made, although it is clear that a precipitation of some kind is involved. The phenomenon is found in practically all medium carbon medium alloy steels. It appears as low notch impact values either at room temperature or at lower testing temperatures when the hardened steel is tempered at about 1100°F, and then cooled slowly through about 850°F; or when the hardened steel is tempered for long times at about 850° to 1100°F. It is a phenomenon of *relatively soft tempered martensite*, and can be avoided in the heat treatment of finished parts by a water quench from tempering temperatures around 1100°F.

The third phenomenon does not have a simple designation. It is manifested by a drop in notch-

impact value when hardened medium carbon medium alloy steel is tempered at about 500 to 600°F. Time at tempering temperature has some effect in that it lowers somewhat the tempering temperature which causes the decrease in impact value. The effect of cooling rate from the tempering temperature is negligible. This decrease in notch-impact value is a phenomenon of *relatively hard tempered martensite*.

Confusion in designating these phenomena might be eliminated if the microstructure involved in each phenomenon is included as part of the designation as shown in Table I.

The third phenomenon, hard tempered martensite brittleness, has been indicated for many years in published notch-impact versus tempering temperature curves in charts of mechanical properties of heat treated alloy steels. The minimum in the curve has sometimes been referred to as "the valley in the impact curve," and some specifications for parts made from heat treated alloy steels require that the parts should be tempered at temperatures other than those which cause the steel to have the minimum impact value.

Higher tempering for HY-Tuf

In all constructional steels except one, the minimum notch-impact value is developed by a temper at about 500° to 600°F. The one exception is HY-Tuf³ in which the minimum notch-impact occurs at about 750°F. Restrictions on tempering at 500° to 600°F therefore cannot be applied to HY-Tuf. Most parts made from this steel are actually tempered at 550°F. No explanation is as yet available to account for the fact that the tempering temperature for minimum impact is about 150° to 200°F higher for HY-Tuf than for other constructional steels.

An attempt to account for the minimum impact value of relatively hard tempered martensite was made by Grossmann,⁴ but the mechanism he suggested was not altogether acceptable. In a more recent and thorough study of this phenomenon, Schrader, Wiester and Siepmann⁵ reached the conclusion that the decrease in notch-impact after the tempering at about 500° to 600°F was attributable to a precipitation of a nitride. On the basis of this premise, it was argued that an addition of aluminum would overcome the tendency for the impact value to decrease with increasing tempering temperature, since aluminum would combine with the nitrogen to form a nitride which was not soluble and

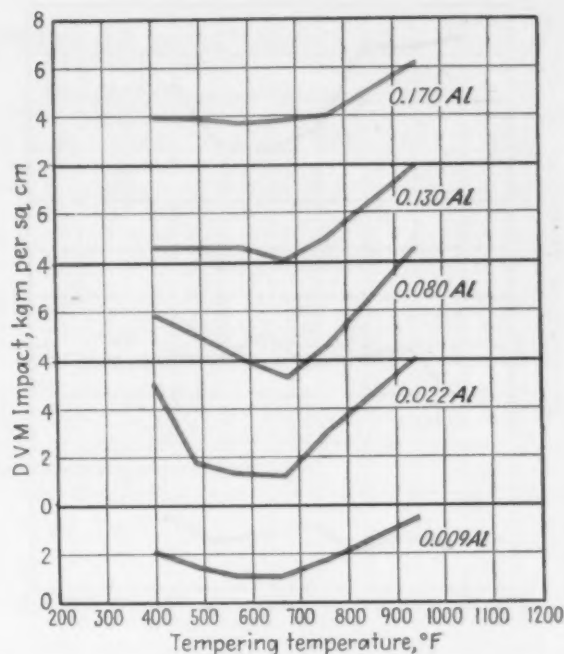


FIG. 1—These samples were quenched in oil from 1560°F and tempered 2 hr before testing.

could not precipitate. Data presented on steels made with various amounts of aluminum seemed to bear out the contention that suitable additions of aluminum eliminated the minimum in the impact-versus-tempering curve. A summary of these data is given in Fig. 1 which is made up from a set of curves in the German publication. Not only is the valley of the curve eliminated in the steels containing 0.13 and 0.17 pct Al, but the minima in the curves of the higher aluminum steels are well above those of the steels with low aluminum. The higher aluminum steels had lower impact values after the 400°F temper than the lower aluminum steels.

Aluminum content varied

Since the data just discussed indicated a rather simple solution to the problem of improving the notch-impact of constructional steels at relatively high hardness, it was decided to check the results reported. Accordingly, three series of small induction heats were made up, a HY-Tuf series, a 4335 series, and an 8735 series. The aluminum contents in each series were varied from about 0.015 to about 0.25 pct. Furthermore, since a nitrogen compound was reputed to be involved in the tempering phenomenon, two additional steels in the 4335 series were made with titanium additions because titanium is known to fix the nitrogen in steel by forming an insoluble compound.

All steels were forged to about 5/8 in. sq bars. Izod test piece blanks were machined from each annealed bar; quenched in oil (the HY-Tuf pieces from 1600°F, and the others from 1550°F); and tempered for 2 hr at temperature at 300°

TABLE I

SUGGESTED NOMENCLATURE

Old Designation	New Designation
1. Blue brittleness	1. Ferrite brittleness
2. Temper brittleness	2. Soft tempered martensite brittleness
3. ?	3. Hard tempered martensite brittleness

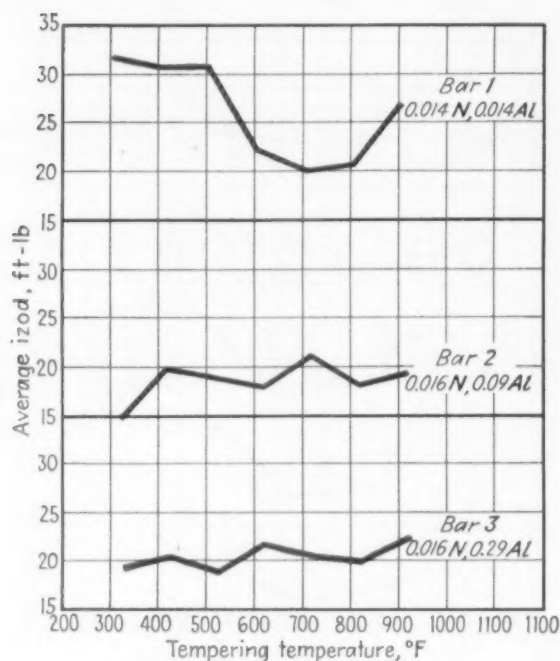


FIG. 2—Hardened and tempered HY-Tuf tested to determine the effect of various amounts of aluminum.

Embrittlement defined (continued)

to 900°F, in 100°F steps; and then air cooled. The heat treated blanks were machined to standard double V-notch Izod test pieces, the notches being finished with carbide-tipped milling cutters.

The notch-impact data obtained, together with the analyses of the steels are given in Table II, and the results are summarized in the three sets of curves, Figs. 2 to 4. In general it may be said that additions of aluminum and titanium lower the impact values of the steels when they are given low tempering treatments. To this extent the present author's data confirm those of the German investigators. However, the present data do not show that increasing aluminum benefits the impact value of the steel tempered at about 550° to 600°F, whereas the data of Schrader, Wiester, and Siepmann in Fig. 1 indicate such a beneficial effect.

Nitride precipitation causes embrittlement

It is obvious that large aluminum additions are to be avoided in steels to be used with tempering temperatures below 600°F. Generally, only HY-Tuf is used with such a treatment, and in its manufacture, the aluminum is held generally below 0.05 pct. In steels which are used with tempering temperatures over about 600°F, aluminum contents up to about 0.25 pct have relatively little effect on the impact values.

On the assumption that aluminum and titanium alter the notch-impact values of martensite tempered below 600°F because of the formation of nitrogen compounds with these elements, it

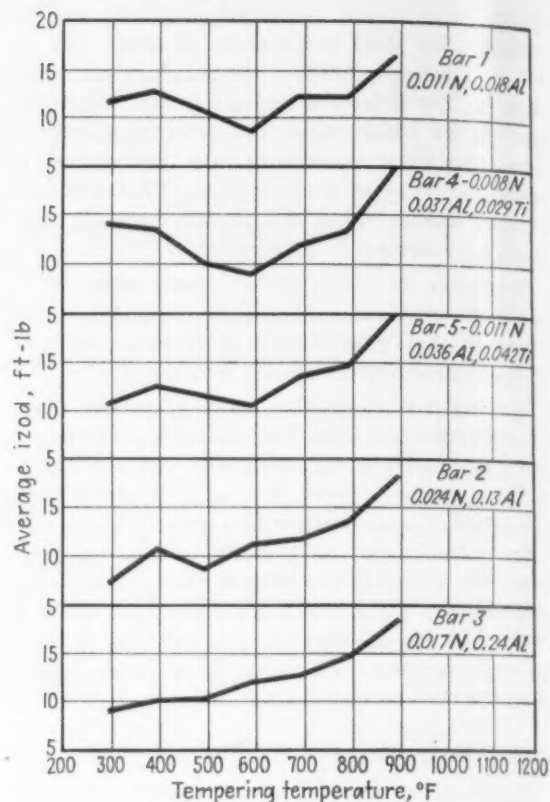


FIG. 3—Hardened and tempered 4335 tested to determine the effect of various amounts of aluminum and titanium on Izod impact tests. Additions of Al and Ti generally lower impact values of steels when they are given low tempering treatments. This confirms some previous findings.

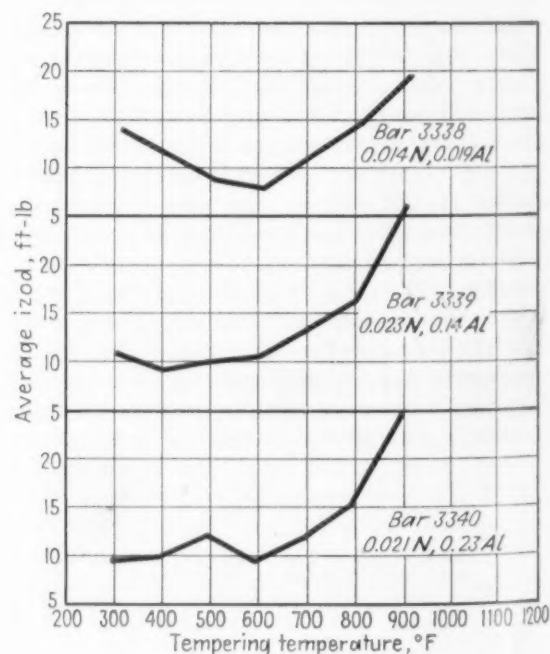


FIG. 4—Hardened and tempered 8735 tested to determine the effect of various amounts of aluminum.

TABLE II

EFFECTS OF AL AND TI ADDITIONS ON THE IMPACT PROPERTIES

Grade	Sample											Impact Strength after Indicated Tempering Temperature												
		C	Mn	Si	Ni	Cr	Mo	N	Al	Ti	300° F		400° F		500° F		600° F		700° F		800° F		900° F	
											Re	Fl-Lb	Re	Fl-Lb	Re	Fl-Lb	Re	Fl-Lb	Re	Fl-Lb	Re	Fl-Lb	Re	Fl-Lb
HY-Tuf	1	0.24	1.07	1.39	1.81	0.10	0.42	0.014	0.014	.....	48	31-34	47.5	27-36	47	29-34	47	21-24	45.5	16-25	42.5	20-22	40	26-28
	2	0.26	1.31	1.60	1.81	0.10	0.42	0.016	0.09	.....	48.5	14-17	47.5	20-21	47.5	19-20	47.5	18-19	46.5	21-22	44	18-19	41.5	19-20
	3	0.25	1.17	1.50	1.81	0.10	0.42	0.016	0.29	.....	48.5	19-21	47.5	20-22	47.5	19-20	46.5	22-22	45.5	20-21	42.5	20-20	40.5	22-23
4335	1	0.38	0.85	0.56	1.81	0.83	0.27	0.011	0.010	.....	55.5	11-13	53.5	12-14	51.5	11-11	50	9-9	47	12-13	45	12-13	43	17-17
	2	0.36	0.80	0.56	1.79	0.83	0.27	0.024	0.13	.....	55	7-8	53	9-13	52.5	9-9	51	11-12	48	12-12	45.5	13-18	42.5	18-19
	3	0.35	0.76	0.62	1.77	0.85	0.28	0.017	0.24	.....	54	9-10	52.5	10-11	51.5	9-12	50.5	11-14	48	13-13	45	15-15	43	18-20
	4	0.37	0.65	0.54	1.81	0.84	0.25	0.008	0.037	0.029	55	13-16	53	13-15	51.5	10-11	49.5	9-10	48.5	10-15	45.5	14-14	42.5	20-21
	5	0.37	0.89	0.89	1.80	0.83	0.26	0.011	0.036	0.042	55.5	9-13	53	13-13	52	11-13	50.5	9-13	47.5	14-14	44.5	15-15	42.5	20-21
8735	1	0.38	0.78	0.58	0.46	0.54	0.28	0.014	0.019	.....	54.5	12-14	53	10-11	51.5	8-8	50	7-8	47	10-12	44.5	14-15	42.5	19-20
	2	0.37	0.86	0.61	0.47	0.55	0.27	0.023	0.14	.....	54.5	9-11	52.5	8-8	52	9-10	50	9-11	47.5	13-13	44.5	15-17	41	26-28
	3	0.37	0.86	0.61	0.46	0.55	0.28	0.021	0.23	.....	54.5	7-10	52.5	8-10	51.5	11-12	50.5	9-9	47.5	11-12	44.5	14-16	41.5	24-25

* Bars 3330, 3331 and 3332 hardened by oil quench from 1600° F, remaining bars hardened by oil quench from 1550° F.

seems reasonable to agree with Schrader, Wieser, and Siepmann that the embrittlement of relatively hard tempered martensite is attributable to a precipitation of nitrides. In conventional steels, nitrides of iron, manganese, or chromium are soluble in the austenite and precipitate during the subsequent tempering of the martensite. In steels containing relatively large amounts of aluminum, over about 0.10 pct, aluminum nitrides are formed which are insoluble in the austenite and hence do not precipitate during the tempering treatment. However, the presence of aluminum or titanium nitrides in relatively hard tempered martensite is just as deleterious as are other precipitated nitrides.

In order to establish the validity of the contention that nitrides in hard tempered martensite have a deleterious effect on the notch impact

value of the steel it would be desirable, obviously, to test steels which contain less than about 0.002 pct N₂. Such steel could probably not be made commercially, but it is hoped that someone interested in the subject from the academic viewpoint will produce very low nitrogen low alloy steels of about 0.35 pct C, and test them for notch-impact after they have been hardened and tempered at 400° to 900° F.

References

- 1 Metals Handbook, 1949 edition, pages 441; 442; 456.
- 2 Jeffries and Archer—"Science of Metals," 1924, p. 182.
- 3 P. Payson and A. E. Nehrenberg — "New Steel Features High Strength and High Toughness," The Iron Age, Oct. 21 and 28, 1948.
- 4 M. A. Grossmann—"Toughness and Fracture of Hardened Steel," Trans. AIME, vol. 167, 1946, p. 39-79.
- 5 H. Schrader, H. J. Wieser, and H. Siepmann—"Embrittlement of Hardened Steel by Tempering at 250° to 400° C (480° to 750° F)," Archiv. f.d. Eisenhüttenwesen, vol. 21, 1950, p. 21-27. Extended abstract translation by W. M. Baldwin in The Iron Age, Sept. 14, 1950.

NEW BOOKS

"Metals and Alloys." Metallurgists, engineers and all who use, buy or sell metals will find this up-to-date reference book a useful aid. Listed in tabular form are the chemical compositions of some 4600 nonferrous alloys. Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N. Y. \$5.00. 214 p.

"The Structure and Mechanical Properties of Metals," by B. Chalmers is a simple explanation of metallurgy. Published under auspices of The Royal Aeronautical Society, the book requires only a general knowledge of physics and chemistry. Metal structure, the effects of alloying elements on structure, and the relation of mechanical deformation and heat treatment to structure are considered. The more important mechanical properties of metals are

discussed. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. \$3.50. 132 p.

"Welding Principles for Engineers," by J. L. Morris, provides a modern and complete treatment of welding from the standpoint of what the engineer needs to know about the process. It is not a "how to weld" text. It includes material on metal spraying, flame hardening, stud welding, flux cutting, braze welding and other recent developments. Contents include chapters on: Welding Metallurgy; A Survey of Welding Processes; Testing and Inspection of Metals; Welding of Commercial Metals; Stress and Distortion; Design For Welding; Factors Affecting Welding Production Economy. Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N. Y. \$7.00. 511 p.

AUTOMATIC GRINDER

cuts stainless conditioning costs

By W. G. Patton

Detroit Editor

Reduction in metal losses, lower maintenance expense, fewer grinding wheels resulted when a new grinding machine was used to condition stainless steel slabs at Rotary Electric Steel Co. Developed by Rotary and Mid-West Abrasive Co., the new machines will eventually replace present swing-type grinders.

Conditioning costs of stainless steel slabs have been reduced considerably at Rotary Electric Steel Co., Detroit, with a new automatic snagging grinder. Other advantages of the hydraulically-operated machine include:

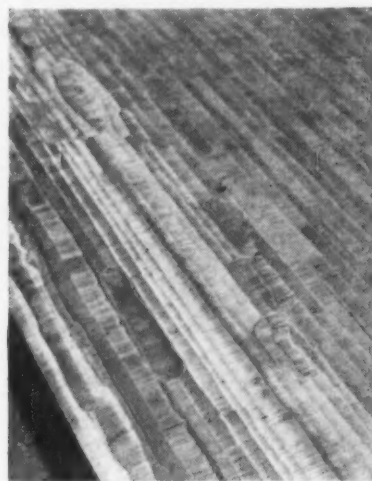
- (1) Reduction in metal loss.
- (2) Lower maintenance expense.
- (3) Elimination of the physical hazards of swing grinding.
- (4) Substantial reduction in physical effort required to prepare slabs for rolling.
- (5) A reduction in the quantity of grinding wheels used.

Rotary expects to eventually replace all swing

grinders with the new snagging grinder. Development of the grinder has been in progress several years. Details of the machine were first suggested by men in the conditioning department at Rotary. Mid-West Abrasive Co. engineers cooperated with Rotary in developing the machine, and Mid-West built the grinder.

The grinding machine moves on tracks parallel with the slab. Forward, backward and vertical motion of the grinding wheel boom is controlled by handlevers. The grinding wheel can be tilted 45° in either direction. Foot controls guide the machine along the tracks.

The grinder has been operating continuously



ERRATIC TRAVEL of old swing grinder (left) has been replaced by more regular grind marks (right) of snagging grinder. Rotary will eventually replace all swing grinders with new type grinder.

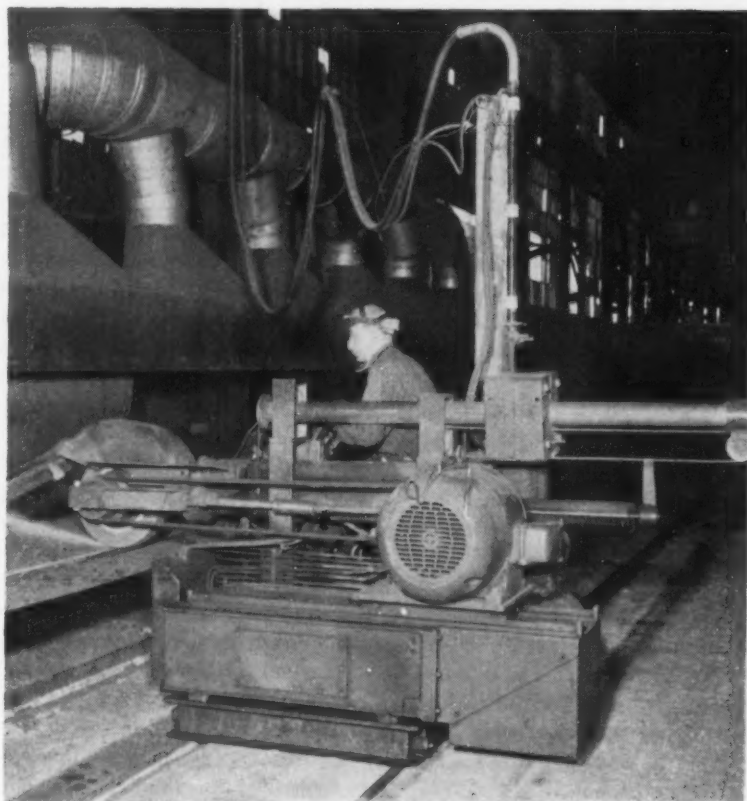
since January, 1951, at Rotary. During this time, there has been a substantial improvement in operating experience.

Safety is a factor in favor of the new machine. Operators cannot drop the wheel accidentally since wheel action is hydraulically controlled. The operator is not in a position where a cracked wheel, even if it breaks during grinding, is likely to cause injury.

Grinding wheel diameter is 20 in. The wheel is 2½ in. thick and has an 8 in. hole. The same wheel grinds both edge and face of slabs. The machine is designed to cover slab widths up to 42 in., and greater if desired. Half the slab is conditioned, then the slab is moved and the job completed.

Either 20 or 24 in. diam wheels may be used. Arbor holes may be varied to meet all standard swing frame sizes. Operators soon learn to use the hand and foot controls. Controls are within easy reach and coordination of hand and foot movements is easily acquired.

SNAGGING GRINDER cuts conditioning costs of stainless steel slabs at Rotary Electric Steel Co. plant. Operator is safely out of way if wheel breaks. Foot and hand controls are within easy reach and quickly learned.



BOOM SUSPENDED grinding wheel is belt driven. Carriage carrying wheel and motor slides along steel ways.

HONING hardened gears

Simplifies Production



By W. G. Patton
Detroit Editor

Broaching splines of hardened gears has been replaced by honing at Warner Gear. Production has been simplified by eliminating necessity for keeping hardness below a maximum. Sorting for selective fit is practically eliminated. Service wear resistance is higher.

To produce necessary accuracy in the internal spline on its high production sliding gears, Warner Gear Div. of Borg-Warner Corp., is finish honing the hardened gears. This same method is employed for second speed gears for trucks. Adoption of honing has made it possible to eliminate the hard broaching operation, which required that hardness in the spline hole should not exceed 35 RC.

The selective fits of gears and shafts are no longer a source of trouble since it is possible to have the operator grind the OD of the shafts and fit the sliding gear to the necessary specifications. Uniformity of the honed spline holes practically eliminates sorting of the gears for size and fit.

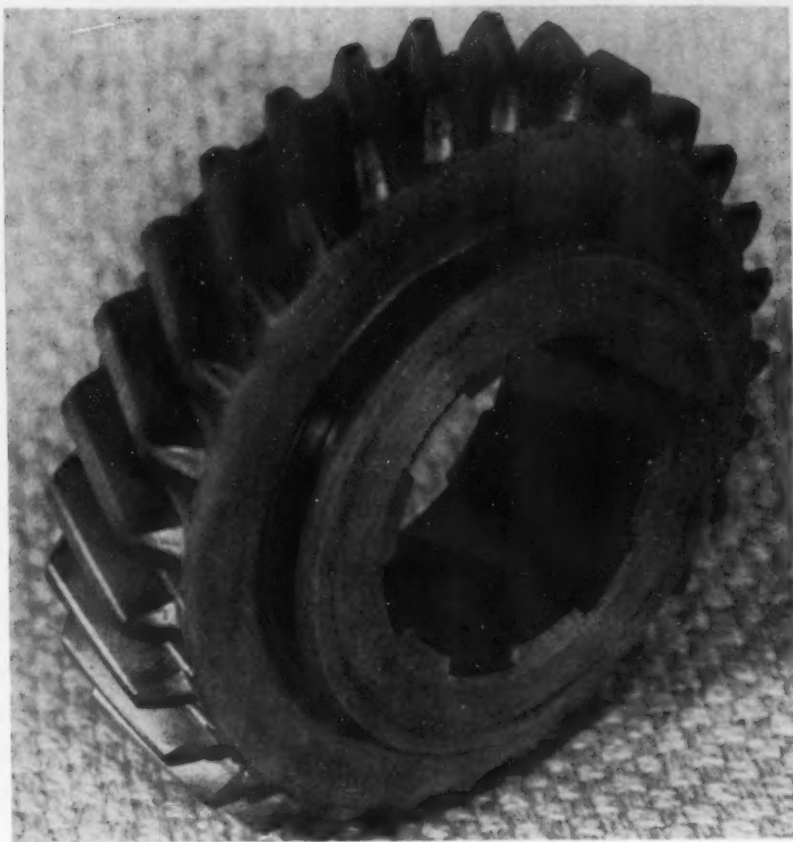
Honing has been adopted both for 6-spline and 10-spline holes, including both straight and spiral splines with straight sides. The illustration shows a typical gear which is finished on a Micromatic honing machine equipped with automatic sizing. The machine indexes three times for either the six or ten spline holes. The honing tool carries the equivalent number of stones to the number of splines, but indexing is used to insure uniformity of size.

The process formerly used to finish the internal splines in these gears was broaching. Previous practice called for the use of oxide filled tubes and sealing spacers to keep the spline holes soft in the heat treat furnace. The fixtures were designed to protect the internal surfaces of splines from carburizing gases. However, due to variations in machining finishes and other factors, more gas reached some areas than others which resulted in a hardness range of 15 to 35 RC. Variation in the hardness of the heat treated gears resulted in poor broach life. The soft gears were not adequate to prevent wear with the mating part after being placed in service.

Operator grinds, fits shafts

To meet the rigid rocking specifications set up by Warner Gear engineers, it is necessary that the same operator be responsible for grinding the shafts and performing actual fitting and checking to provide for proper rock. Rock specifications vary, depending upon the nature of the transmission involved. The amount of reading for rock is taken at an average of 3 to 4 in. from the sliding gear.

The first attempt to improve the hardness con-



TYPICAL gear on which internal splines are honed.

dition of the spline holes was an effort to minimize the range. This resulted in poor tool life and the decision to try honing was made.

The use of honing on high production sliding gears calls for leaving enough stock for clean up although excessive stock is not permissible. During heat treatment stresses are set up which may result in considerable distortion if not properly controlled. Since honing was adopted no attempt has been made to limit the hardness of the spline holes during the heat treat operation. The sliding gears are run through continuous gas carburizing furnace which produces an average 0.035-in. case. The hardness is 55 RC. The present steel specifications are SAE 8620 and 4027, though these may have to be changed during the alloy shortage.

With the present process method, width of the splines is maintained in the untreated gear. Honing relief is broached in the untreated gear at each side of the spline to make it possible to hone the OD or major diameter of the spline. Tolerance for the major diameter of the spline does not exceed 0.001 in. and care is taken to maintain a closer limit.

There are several advantages of the hone method of finishing. The honing of the splines

in no way affects the relationship of the external gear teeth and thus quality is maintained the same as the untreated gear after shaving of the gear teeth is completed. The gear is held at a uniform hardness which includes the spline hole and provides for and eliminates any trouble due to wear with the mating part. In addition to the production of gears at a high rate and to close tolerances, indexing and automatic sizing features of the honing machine insure the production of an acceptable part even though stones may be slightly worn.

Straightening not needed

No straightening of the gears is required after heat treatment and no quenching fixtures are employed. The quenching medium is mineral oil. Special care is taken to see that parts are not nicked during the untreated stage as well as during the heat treatment, since nicks will not be removed readily by the honing operation and may cause breakage of the honing stones.

During the past two years many thousands of highly stressed gears have been processed as described. Service reports have been excellent.

The method now being used has been satisfactory and insures a quality product.

ALUMINUM scrap recovery SAVES 5 million LB



By Herbert Chase
Consultant
Forest Hills, N. Y.

Chrysler's scrap system yields a net profit—and provides 57½ pct of the aluminum for pistons. Even extremely fine chips are reclaimed and furnace dross is reworked. The part-time work of fifteen men is required, since the setup is not run continuously.

As all Chrysler cars use cast aluminum alloy pistons that are finished in the corporation's own plants, a sizable tonnage of chips results from machining operations. About 75 pct of the pistons are cast in the plant and the remainder are purchased ready for machining from outside sources. A setup for reclaiming the chips (of which almost 5 million lb were produced in 1950) is installed adjacent to the piston casting setup. This large scrap tonnage is recovered and recast with a substantial saving.

Actually, the recovery procedure applies to virtually all scrap aluminum. This includes some that comes from sources other than pistons, such as that from machining aluminum die castings and scrapped patterns from sand foundries. All such scrap is segregated and sent to the recovery setup. Checks made over 30-day periods have shown that about 57½ pct of the metal that Chrysler casts into pistons comes from the recovery setup. About 1½ pct of the chips recovered are too fine for economical remelting. These are separated out and find a good market for paint or related applications, so that they represent little if any net loss.

Naturally, the saving is offset in part by the cost of operating the recovery system, including interest and amortization charges. Yet it yields a considerable net, as well lowering the

outside aluminum purchases by the tonnage actually saved. It requires part of the time of fifteen men to operate the recovery system but it is not run continuously. When not in operation, the personnel from the recovery section is transferred to other operations related to piston casting.

General arrangement of the recovery setup is shown in the diagram, Fig. 1. Chips are received in metal skid boxes, which are emptied onto the conveyor of a magnetic separator, Fig. 2. This removes iron or steel particles that may be present. Discharged by the separator onto a bucket conveyor, the chips enter a surge hopper that feeds the chips in batches into one of a pair of chip "wringers," or centrifuges. Water and live steam are fed through the chips to remove oils that the chips may contain.

A suction system draws the clean chips from the centrifuges into the drum of a dryer, where they are heated to 600°F. A conveyor elevates and discharges them onto a screen, Fig. 3, through which the fines drop. Most of the chips do not pass the screen and are fed through a cylindrical magnetic separator, also shown in Fig. 3. This removes any ferrous chips not taken out by the first separator.

Chips are then ready for melting and are conveyed into two storage hoppers. Each hopper feeds a 166-kw low-frequency, induc-

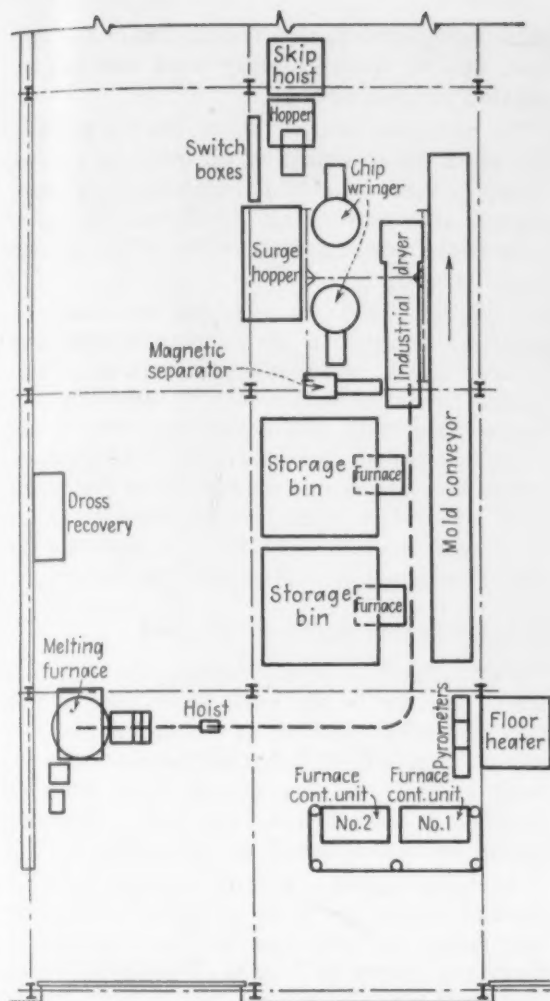


FIG. 1—General layout of the aluminum recovery system. Almost 5 million lb of chips were reclaimed from machining operations during 1950. Part time efforts of 15 men are required to run the recovery system intermittently.



FIG. 2—Scrap is dumped by this skip hoist onto the conveyor of a magnetic separator, where tramp iron is removed.



FIG. 3—Clean, dry chips are fed onto shaker screen at top of photograph. Except for fines, which are collected below, the aluminum scrap is elevated into storage hoppers, after passing through a second separator.

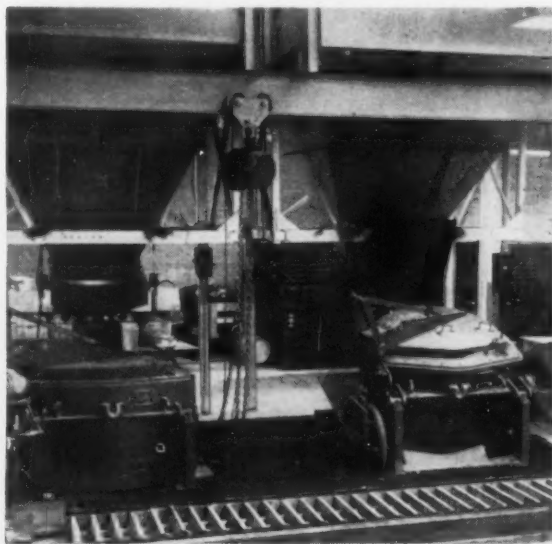


FIG. 4—Scrap is fed into these 166-kw, low-frequency induction furnaces from the hoppers above. Furnaces tilt to discharge their heats of about 1600 lb each.

tion-type melting furnace, Fig. 4. There is a vibrator unit at each hopper outlet that feeds the chips out at a predetermined rate. They fall directly into the heel of molten metal that is kept at all times on the furnace hearths. Furnaces are used alternately, one melting the chips while the other is tilted to discharge molten metal. A cast iron trough carries the

Aluminum scrap recovery (continued)

liquid aluminum into cast iron molds mounted on an ingot conveyer, Fig. 5.

In each 8-hr shift, each of the furnaces melts and pours three heats totaling about 5,000 lb. Small amounts of manganese, copper and silicon sometimes are added to make up for possible losses and to bring the chemistry reasonably close to that required in the piston alloy to be cast. All ingots cast are assayed before being melted again. Each heat is kept separate until after assaying so that, when remelted, any departure from desired analysis, see table, can be corrected by other additions. Castings are thus kept within analysis limits.

In the induction furnaces, there are passages in the refractory below the hearth. These are always filled with molten metal that is rapidly heated by the induced current and automatically kept in rapid circulation. This circulation keeps molten metal on the hearth agitated. Some of its heat is absorbed in melting the chips as they mix with the molten metal. Actually, the rate of melting can be adjusted so that the electrical energy supplied to the furnace equals the heat needed to melt the chips.

As long as chips are being fed and metal melted, the temperature of metal on the hearth remains at the melting point of the alloy. But, when chip feed is cut off and all metal in the furnace is in molten form, the temperature rises to the pouring temperature of 1280°F. This is maintained automatically thereafter by thermostatic control. When the metal reaches pouring temperature, the electrical input is automatically reduced and remains only suffi-

cient to equal radiation losses. These are very low, due to the refractory used and the insulated furnace cover.

To hold iron content below the 1.5 pct permitted in the specification, an iron-free furnace lining is used. The iron trough through which molten alloy is run into molds and the molds themselves are kept well coated with an iron-free fire clay.

Nine pounds of flux is added per heat. Circulation of metal in the furnace brings dross to the surface, where it is skimmed off. Skimmings from the induction and remelting furnaces along with any dross that rises in the discharge troughs are taken to a small furnace. There they are run down with more flux, along with sweepings from the department. Alloy recovered in this operation is returned by trolley ladle and is emptied into the furnace.

Salvage ingots mixed with others

Cast ingots continue along the conveyer under cooling hoods until they solidify and fall or are knocked out at the end of the conveyer. Ingots in each box are marked with the heat number and are stored there until an analysis is returned to the shop. Rejected ingots are also remelted and reclaimed.

Accepted ingots are transferred to and are stacked beside two rows of 3000-lb reverberatory furnaces, numbering fifteen in all. Two of these are shown in Fig. 6. Purchased ingots are similarly placed and mixed with ingots from the recovery setup. Also added at these furnaces are scrapped castings and risers sheared from castings, as well as any elements needed to bring chemistry to specifications. Such additions are seldom required. All reverberatory furnaces have refractory linings and

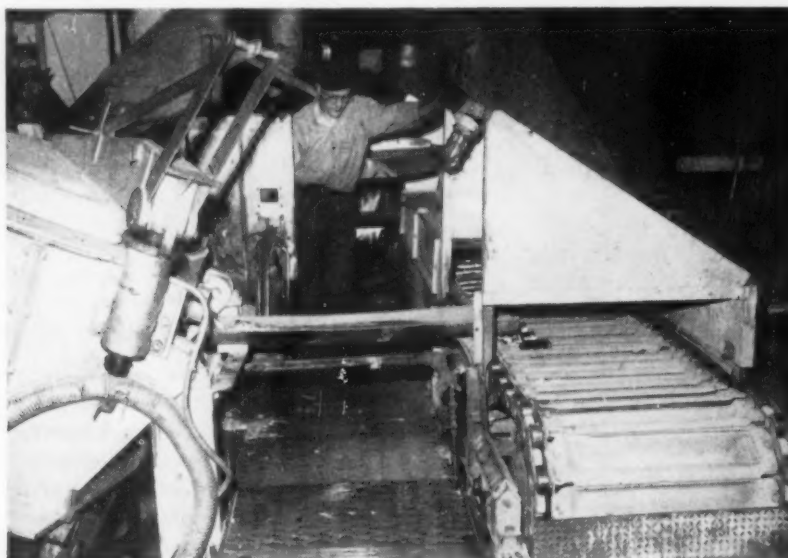


FIG. 5—The molten aluminum runs through a fireclay-coated trough into ingot molds on conveyor. Furnaces melt and pour 5000 lb during each 8-hr shift.



FIG. 6—Operator is shown charging reverberatory furnace with ingots. Metal is ladled from two wells at opposite ends. Both virgin and recovered metal is used.

PISTON ALLOY CHEMISTRY

Copper.....	6.25-7.75 per cent
Silicon.....	5.00-6.00 " "
Magnesium.....	0.20-0.50 " "
Iron.....	1.50 per cent max
Nickel.....	0.60 " " "
Manganese.....	0.80 " " "
Zinc.....	0.90 " " "
Chromium.....	0.20 " " "
Titanium.....	0.20 " " "
Cadmium.....	0.005 " " "
Total Other Impurities.....	0.15 " " "
Remainder.....	Aluminum



FIG. 7—A two-spout ladle is used to pour aluminum into sprue openings of a permanent piston mold.

are charged at one side. Metal at casting temperature is ladled from a well at the opposite end of the hearth.

Two casters work at each furnace and each operates two permanent molds, filling them alternately. All pouring is done with two-spout ladles, Fig. 7. All ladles are of Inconel and are kept well-coated. Each mold has two sprue holes and a riser hole at the center and is operated by a semiautomatic machine. This opens and closes the mold and also operates the cores.

A mold is shown with the two halves opened (horizontally) in Fig. 8, and with the central core withdrawn. When this core has been pulled downward, the two side core sections which contain boss cores, are moved together horizontally. This frees the piston casting. It is then removed with tongs and placed on a carrier hanging from a chain conveyor that moves parallel to the rows of machines and furnaces. The cores of all molds are water cooled. The water temperature is thermostatically controlled and constant pressure is maintained.

After the piston casting is removed and inspected, the operator closes the mold automatically and core sections are reunited in casting position. As soon as it is filled, the caster opens the second mold he operates, as the casting therein has had time to solidify and is ready for removal.

Each man can produce about 300 castings per machine per 8-hr shift, or 600 castings a day. He must reject any defective castings

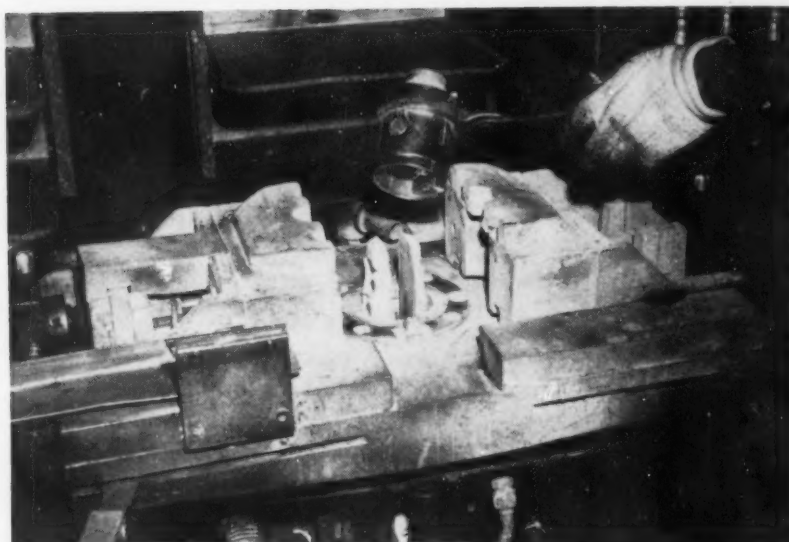


FIG. 8—To remove a cast piston, halves of mold open, center segment lowers and the core's side sections move together.

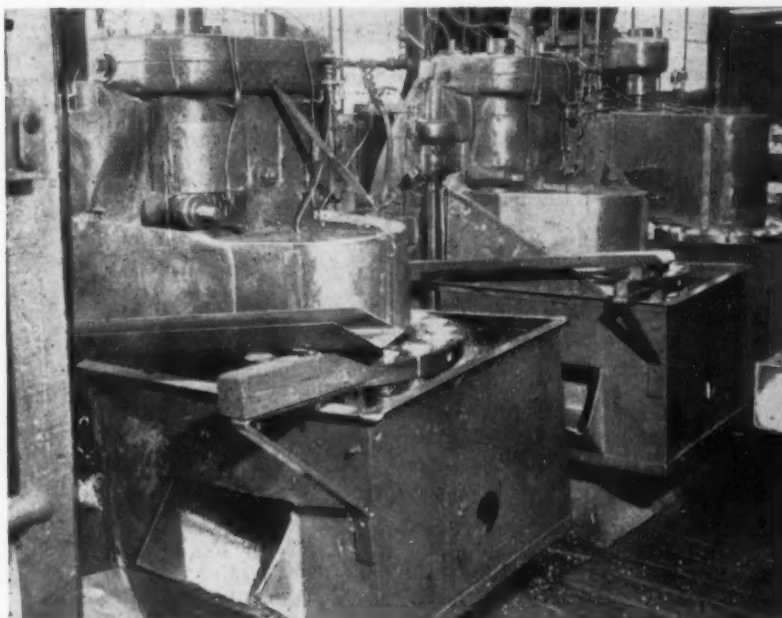


FIG. 9—Roughing cuts across heads of the pistons are made by these 16-station milling machines. Conveyor delivers pistons to bin at rear of millers.

Aluminum scrap recovery (continued)

and must also care for the two molds he uses. These must be kept properly coated with a refractory mix that is sprayed on and must be repaired should chipping result in defective castings. Once a week, all old coating is removed and an entire new coating is applied and dried before the mold is used again.

Castings from the two lines of furnaces have to undergo an aging treatment for six hours at 425°F before machining. The two conveyors on which the mold operators place the cast pistons enter the oven at the same point and make three loops before emerging. Thereafter, the conveyors pass beside presses where oper-

ators remove the pistons in pairs and lay them two at a time in dies that chop off risers.

A conveyor delivers the pistons to a bin that is back of the three milling machines, Fig. 9, equipped with dial fixtures that hold 16 pistons each. These fixtures rotate slowly and carry the pistons under horizontal milling cutters that make roughing cuts across the head of each piston. This is the heaviest cut required in machining and removes any remaining portion of the riser as well as bringing the piston heads close to finished thickness. These machines produce a large volume of chips. Other machining is done in other departments, some of which are in other plants from which chips are also returned.

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Furnaces

Advantages of Ruppman industrial furnaces are described in several new leaflets. The portable open chamber and muffle furnaces for gas or oil offer uniform distribution of heat and accurate maintenance of temperature. Hot galvanizing and tinning furnaces have low fuel demand, excellent regulating possibilities and rugged construction. *Wilhelm Ruppman.*

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Hydraulic duplicator

Production savings possible with the Turchan hydraulic duplicator are described in 6-p. story-folder. The duplicator, which includes a 45° lathe compound attachment, power unit, and tracer valve can be used to convert lathes to automatic operation. Parts with contours on the diameter or face can be duplicated. *Turchan Follower Machine Co.*

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Blowers, compressors

A new 52-p. book on centrifugal blowers and compressors has been published. The book contains comprehensive data on types of blowers and compressors. Information, in four sections, includes engineering data, drives, design and construction, and application data for various industries. *DeLaval Steam Turbine Co.*

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Turn Page

Materials handling

A revised edition of *The HOW Book of Cost-cutting Materials Handling*, 24 pages of information on how to analyze your own materials handling problems, is now available. Starting from scratch the book gives a step-by-step explanation of materials handling problems, and includes samples of the Vis-O-Graf sheets and template rule with which you can break down the problems in your own plant. *Yale & Towne Mfg. Co.*

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Flame stretcher

A system of immersion heating affording the economy of crude fuel as well as automatic operation features, is described in a 6-p. folder. The system consists of a burner enclosed in an immersed tube with the flame and products of combustion drawn through the tube under partial vacuum. Composition of heating surfaces is determined by the material being heated. *Dewey Gas Furnace Co.*

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Heavy machinery

Rolling mill equipment, presses, straighteners and other basic manufacturing equipment are described in new 54-p. catalog. The design and construction of mills, Tube Plants, heavy electric-hydraulic presses is described. *Maschinenfabrik Meer A. G. M. Gladbach.*

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Multi-purpose machine

A portable multi-purpose machine equipped with motor, gear box, flexible shaft and chuck is described in a new 24-p. booklet. A variety of attachments permit use of the machine for many buffing, grinding, cutting and cleaning operations. *K. Wette.*

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Charts showing the capacities required of safety valves to give 100 pct protection in case of pressure-reducing valve failure are illustrated in a new 14-p. bulletin. A gas volume-weight chart for determining volumes per lb of gases at various specific gravities, pressures and temperatures is included. *Marine & Industrial Products Co.*

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Heavy-duty fork trucks

Complete engineering and operating information on Baker's type JOM fork trucks is given in a new 6-p. bulletin. Drawings and cutaway photos compare the new trucks with other heavy-duty standup models. *The Baker-Raulang Co.*

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Pneumatic oil torch

A portable, pneumatic oil torch for foundry use is described in a new leaflet. The torch burns low grade oil and is suitable for drying moulds and cores, warming-up of cast steels and aluminum moulds and flaming of permanent moulds. *E. Schneider.*

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Military packaging

A new 36-p. two-color pocket booklet outlines government packaging specifications which involve flexible protective barriers against moisture, mildew and corrosion. Information on current Army, Navy and Air Force requirements is included, and JAN, AN, MIL and UU specifications are cross-indexed. Both methods and materials are covered with many illustrations of packaging procedures. *Mehl Mfg. Co.*

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Construction features of an oil-lubricated bearing, pedestal-mounted pump for handling chemicals, liquors, corrosive materials and solutions, hot liquids and petroleum are described in a 6-p. bulletin. Dimensions and specifications of the pump, available in capacities to 1200 gal per minute at heads to 250 ft and temperatures to 500°F, are given. *Allis-Chalmers Mfg. Co.*

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The Swartwout Autronic control system is described in a new 4-p. bulletin. Photos, drawings and a schematic diagram show the principle of operation of the miniature all-electronic system for controlling pressure, temperature, flow and level. The system is designed for use in chemical processing plants, refineries and in operations requiring fast, accurate control. *The Swartwout Co.*

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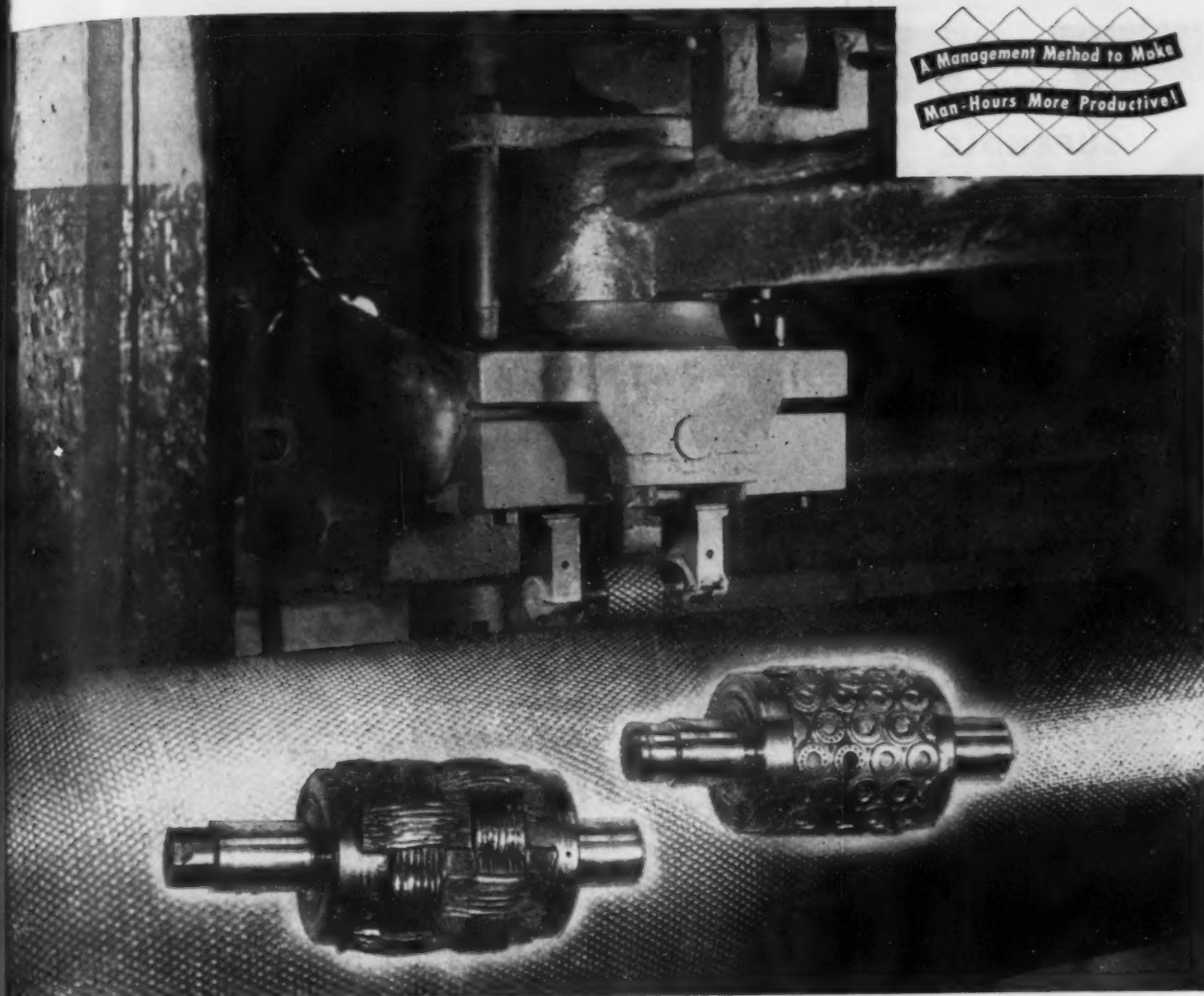
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Degreasers

A new 12-p. bulletin describes degreasing equipment and typical applications for vapor degreasers. The process is explained and photos show plant installations. Applications of degreasers for both tank and conveyer units are described. *Phillips Mfg. Co.*

For free copy insert No. 14 on postcard, p. 186.

Heat treatment

Production heat treatment of small caliber ammunition is described in a new 4-p. bulletin. Fuel-fired batch and continuous furnaces are used. Step-by-step, from raw material to finished product, the heat treatment processes for various types of ammunition are described in conjunction with proper furnace equipment. *Furnace Combustion Corp.*

For free copy insert No. 15 on postcard, p. 186.

Speed reducers

A 96-p. pocket catalog gives engineering specifications, technical information on speed reducers and gear motors for a variety of applications. Selection of the proper unit for your equipment is simplified by complete listing of information in tabular form. Data on how to select a speed reducer for a particular job is included. *Abart Gear & Machine Co.*

For free copy insert No. 16 on postcard, p. 186.

Open steel flooring

A 16-p. idea-book, *Versatile—Open Steel Flooring*, shows the many possibilities for the use of steel grating. It explains types and features of open steel flooring, gives specifications, and contains information on proper installation. The book is profusely illustrated. *Open Steel Flooring Institute, Inc.*

For free copy insert No. 17 on postcard, p. 186.

Regulators

Pressure and temperature regulators are described in a new 12-p. bulletin. Dimensions application, capacity, engineering tables and specifications on these precision regulators are included. *O. C. Keckley Co.*

For free copy insert No. 18 on postcard, p. 186.

NEW equipment

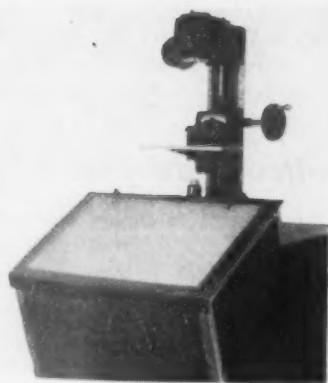
New and improved production ideas, equipment, services and methods described here offer production economies... fill in and mail postcard on page 103 or 104.



Vertical position eliminates deflection errors

This machine grinds the external surfaces of the hubs of aircraft propeller blades, including ball race ways. A workholding fixture on an antifriction bearing work spindle holds the blade in a vertical position and the required grinding is quickly and accurately performed in this position. This method is said to avoid the errors normally brought about by deflection when

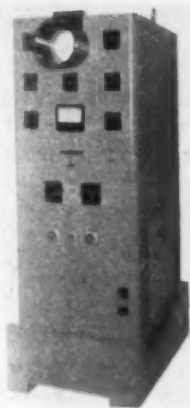
the blade is held in a horizontal position. The wheel spindle is also antifriction bearing construction and is mounted vertically. Power positioning of the work spindle for ball race grinding operations and power feed of the grinding wheel, simplify operation. The machine takes less floor space than do standard horizontal machines adapted for the same purpose. *Norton Co.*
For more data insert No. 19 on postcard, p. 103



Comparator has large mechanical capacity

The new Century optical comparator incorporates several different mechanical and optical features. A Super-light condenser lens unit that is power cooled provides exceptional screen definition. Used with color filters the intensity and shading of light may be varied. A new stage design provides large working space, and includes a swing feature permitting the entire stage

and workpiece to be moved to one side for changeover of lens units without disturbing work setups. A Ciptar-Scope optical system provides long focal lengths, maximum light, large objective areas and sharp definition. Focal lengths average 3 in. and magnifications range from 10X to 100X. *Portman Instrument Co.*
For more data insert No. 20 on postcard, p. 103

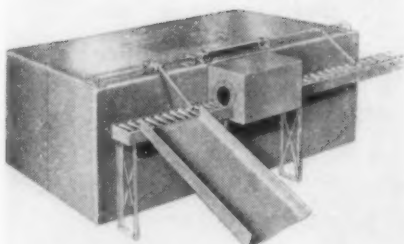


Tester checks entire armature in 3 or 4 min.

A new dc winding-insulation tester will detect and aid in locating faults in turn-to-turn, coil-to-coil, and winding-to-ground insulation in dc armatures of any size and rating. It is designed for testing large motors and generators such as those in railroad, marine, and steel industries. The device consists of a repeating type, surge-voltage generator that operates 60 times a sec and a cathode-ray oscilloscope, all in one

cabinet. A fixture is provided for applying test voltage to the commutator of the armature being tested. As each armature is being inspected, the operator has merely to glance at the oscilloscope screen to see if the surge wave shown is of proper shape and amplitude. Any variance from the correct wave indicates a fault in the tested armature. *General Electric Co.*
For more data insert No. 21 on postcard, p. 103

Turn Page



Furnace assures uniform heating of billets

A new 60 cycle induction furnace for heating nonferrous metals and some applications of steel provides absolute uniformity of heating and assures balanced electrical loading from a three phase line. A transformer converts balanced three phase power into two phase operation.

Two closely interlaced coils, leading off this two phase line surround the billet and provide characteristics of uniformity and thorough penetration of single phase heating. The furnace is built to customer's specifications. *Lof-tus Engineering Corp.*

For more data insert No. 22 on postcard, p. 108



Records mechanical and electrical story

A modification of the Kodak high speed camera permits both the mechanical and electrical aspects of a subject to be recorded simultaneously on the same film. A second lens added to the camera records the images on the tube of a cathode-ray oscillograph through the back of the film, while the mechan-

ical aspects of the subject are being photographed on the front. This record presents a complete picture of the behavior of electro-mechanical devices, and permits easy correlation with strain, acceleration, vibration, and other signals fed to the oscillograph. *Eastman Kodak Co.*

For more data insert No. 23 on postcard, p. 101



Conveyer handles cylindrical objects

For handling all types of cylindrical objects such as shells, a new concave roller conveyer keeps the cylindrical objects in the center of the conveyer line, and prevents them from slipping to either side or sliding off the conveyer line. For handling most cylindrical objects

the guard rail is no longer necessary. Made of No. 10 gage steel tubing, the roller is available with 7/16-in. shaft for ordinary work or an 11/16 in. shaft for heavy duty work. Straight and curved sections are available. *Alvey-Ferguson Co.*

For more data insert No. 24 on postcard, p. 103



Light hand tool does medium-heavy duty work

Working at 120 psi this air hammer strikes up to 6000 blows per min. with maximum force, or may be metered to any lower speed or striking power by means of a simple finger trigger action. A new three-point ball-bearing chuck locks tools

in working position and eliminates hazard of tool ejection. Driving piston constitutes the only moving part. Sixty-six different tools are available for use with the G-200 hammer. *Salsbury Corp.*

For more data insert No. 25 on postcard, p. 103



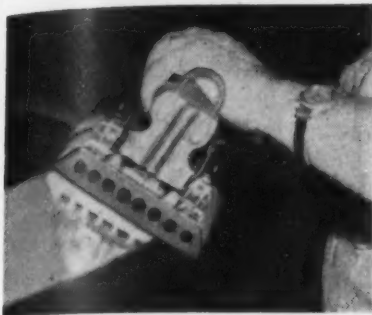
Metallizing guns spray at high speeds

Two new metallizing guns are expected to reduce many machine part repair and salvage costs 85 to 90 pct and provide 25 to 30-year corrosion protection of equipment and structures. The new guns, Type 4E for machine element work, and Type 5E for corrosion protection coatings are said to develop the highest spraying speeds yet available in guns designed for hand-held

operation. They incorporate a jet siphon principle in the gas head that automatically compensates for variations in gas pressure. The guns also incorporate automatic control of wire feed. Wires from 20 B&S gage to 1/8-in. in any metal can be sprayed with the 4E gun. The 5E gun sprays the softer metals. *Metallizing Engineering Co., Inc.*

For more data insert No. 26 on postcard, p. 103

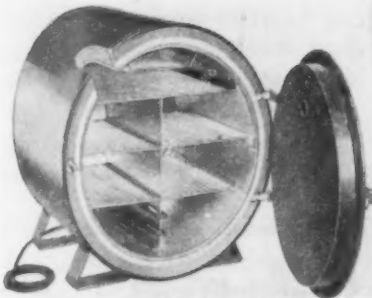
New Equipment



Sander speeds finishing

Because of its straight-line action, a new air sander removes scratches, defects, and leaves no swirls or pressure marks when finishing welded seams. The seam is grained and blended-in perfectly after assembly. Grinder marks are quickly removed. *Sundstrand Machine Tool Co.*

For more data insert No. 27 on postcard, p. 103



Controlled moisture

With the DryRod electrode oven protection against moisture absorption is provided to users of mineral-coated electrodes. It is claimed the oven fills the gap between unpackaging of manufacturer's sealed containers and actual use. *Philip Roden Co.*

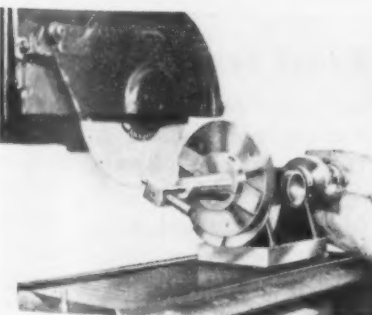
For more data insert No. 28 on postcard, p. 103



Thread-gaging tool

Inspection of threads in tapped holes is speeded up with a pneumatic tool that is used in conjunction with standard taper-lock plug gages. Operation is simple: just press, and the motor spins, screwing a go gage into the hole; pull, and it reverses, backing the gage out. *Keller Tool Co.*

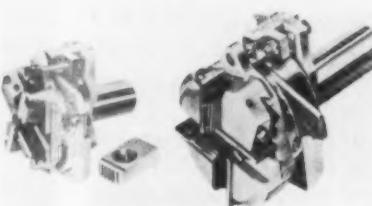
For more data insert No. 29 on postcard, p. 103



Unit dresses wheels

The wheel dresser is a compact, rugged and precision built unit which when mounted on a magnetic chuck can accurately dress any radius. It does not require center mounted diamonds and it permits dressing below the wheel for use of guards and dust collector. *Last Word Sales Co.*

For more data insert No. 30 on postcard, p. 103



New die head line

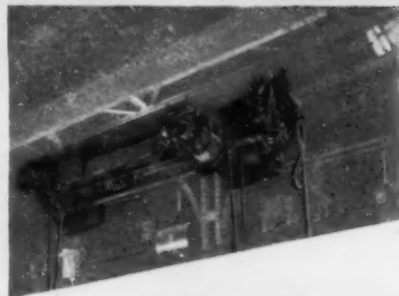
Class III threads are guaranteed with a new die head line for B&S automatics and small turret lathes. A single given size die covers the capacity of a given machine size. *Jones & Lamson Machine Co.*

For more data insert No. 31 on postcard, p. 103

Modern
Handling System

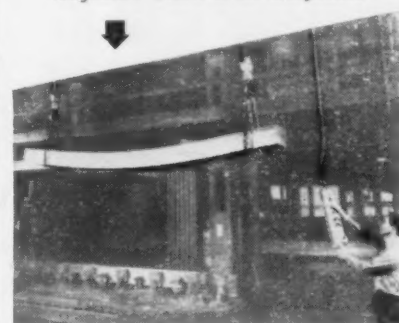
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—New Equipment—

Continued

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For more data insert No. 32 on postcard, p. 193

Steel drill rod

Hardened and ground high speed steel drill rod in standard 36-in. lengths is available. Blanks are said to have the equivalent toughness of conventional tool steel materials yet measure approximately 6 points higher on the Rockwell C scale. Blanks are available as hardened, tempered and centerless ground in 3/32 to 1 in. diam, with a diameter tolerance of ± 0.001 in., or as hardened and tempered only in sizes from 0.118 to 0.515 in. *Ace Drill Corp.*

For more data insert No. 33 on postcard, p. 193

Exact temperature

For checking exact temperature of molten babbitt metal, solder, lead, etc., an improved Temperometer is available. The actuating element of this instrument is a bi-metallic coil enclosed in a tube. When the tube is placed directly into molten material, heat is transmitted to the sensitive coil. This revolves in proportion to the degree of heat. A pointer attached to the end of the pointer shaft indicates the temperature on a calibrated dial. The unit is entirely of stainless steel to prevent corrosion. *W. C. Dillon & Co. Inc.*

For more data insert No. 34 on postcard, p. 193

Turn to Page 113

—New Equipment—

Continued

Oil-retaining surface

Moving parts made of iron and steel can get two-fold protection with a chemical treatment known as Rustshield 2. It is a phosphatizing compound which changes steel and iron surfaces to rustproof, highly absorbent non-metallic areas. Such a Rustshielded steel surface is an excellent base for the retention of lubricating oils and metal parts so treated remain lubricated longer than smooth steel surfaces. Danger of scuffing and galling is virtually eliminated and break-in time is reduced. *Octagon Process, Inc.*

For more data insert No. 35 on postcard, p. 103

Decorating masks

Increased production with uniform coloring is claimed for spray masks being used by the glass, ceramic, plastic, rubber and metal fabricating industries. The spray mask is a shell-like mold which fits snugly over an object to be colored. The surface to remain protected is covered by the mask. Unskilled workers can easily spray any color pattern on an object with perfect results and minimum fatigue. Each mask is engineered to fit a customer's specifications. *Jas. H. Matthews & Co.*

For more data insert No. 36 on postcard, p. 103

Coal flow stokers

Accurate adjustment of the coal-feeding rate to the exact load demand is being achieved through infinitely variable transmission on two of Iron Fireman's coal flow stoker series. A feature with the CF series coal flow stokers and CF series Poweram coal flow stokers, the variable drive is particularly suited for use with modulating-type combustion control. Infinite speed range is provided by a simple, durable mechanism that eliminates many service and adjustment problems. Automatic overload device and torque indicator of spring scale accuracy is built into the transmission. *Iron Fireman Mfg. Co.*

For more data insert No. 37 on postcard, p. 103

Turn Page

September 27, 1951

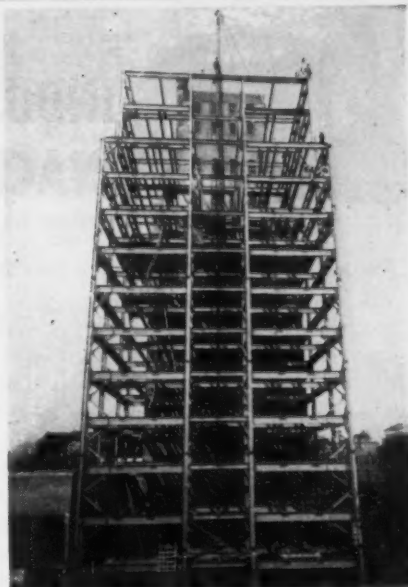
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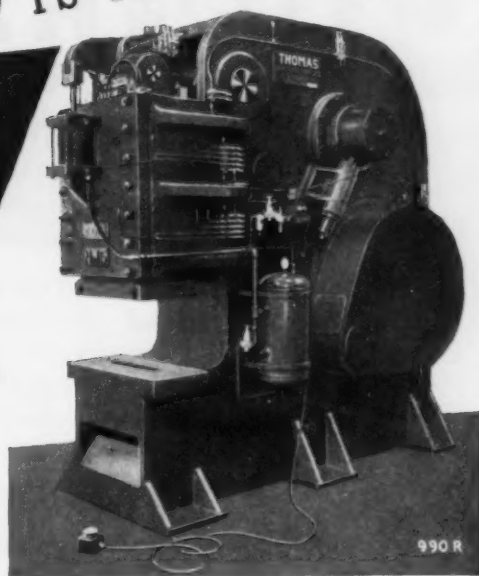
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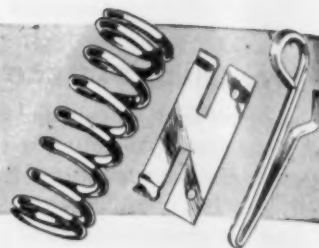
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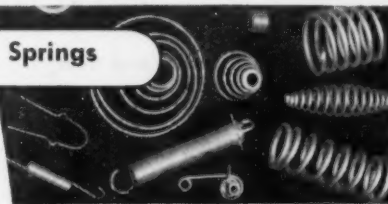
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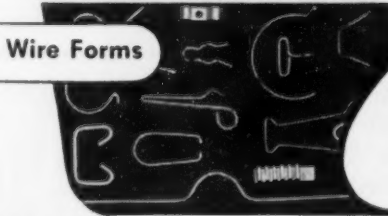


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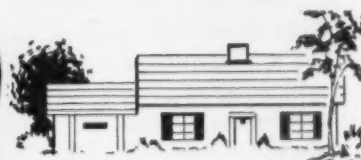
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THE IRON AGE

Consumers May Find Stainless Bonus Paper Tonnage

Transfer of military stainless results from delay on aircraft projects . . . Cancellations lag behind cutbacks while consumers appeal . . . Cutbacks cause confusion . . . Ingot rate up.

The 10,000-ton windfall of stainless steel to be transferred from military to civilian consumers in the fourth quarter may turn out to be mostly paper tonnage.

The stainless steel line forms at the right. Other stainless steel users still trying to place orders for unhonored Controlled Materials Plan tickets are at the head of the line. They'll present their tickets to the mills before other benefiting consumers can chew their way through paper work needed to qualify for their stainless bonus.

Projects Delayed—Happily, many of these frustrated ticket holders are the same people (consumer durable, auto and construction) who will be given the extra stainless steel allotment. They now stand a good chance of getting steel for their tickets. Benefits will come in November and December, since lead time for October production is past.

The military stainless became available for civilian uses because of misjudgment as to when new facilities (chiefly aircraft) would be ready for production. Some aircraft projects which use stainless are running 6 months or more behind schedule.

Nickel Tight—The fact that most of the bonus tonnage is straight chrome, not nickel bearing stainless, indicates no easing of the nickel shortage. Quite the contrary, first quarter quotas of nickel bearing stainless may be drastically reduced because of tight nickel supply.

Steel officials feel the military

has at times overstated its needs on some products. But mills can't do anything about this until they get the word to cut back.

Change of Mind—The landing mat program is an example: Last June mills started shipping rush orders of heavy gage hot-rolled steel for this program. By August they were told to slacken off; the government didn't need all they set aside. In September they picked up again. Now, they've slipped back—first quarter orders for this program are being allowed to carry over into the second quarter.

The military is also permitting structural steel for Bailey bridges to be extended. Slight as it is, this relief is welcome because structurals are the tightest of the tight items in the steel market.

Other evidence that government programs are not yet straightened out is the apparent lack of coordination among agencies in placing first quarter orders. Evidently some agencies are able to move faster than others. This has resulted in a full book on some products while others are comparatively open.

Squeeze Play—National Production Authority insists that large order cancellations are bound to come because drastic cutbacks have been made. They haven't come yet. Consumers don't discourage easily. They are holding onto their orders while they appeal the cutbacks. Appeals take time, and Washington traffic is jammed. Meanwhile, cancellations are delayed.

NPA is exerting all possible pressure to induce consumers to cancel duplicate or cutback orders. In Pittsburgh NPA inspectors spent several weeks with one producer and managed to weed out duplicate orders totalling several thousand tons. Consumers explained they had left them on the books hoping to get additional CMP tickets to cover them.

Cutback Confusion—October cutbacks are causing confusion for both producer and consumer. In some cases news of cutbacks has been received after the orders were in process at the mill.

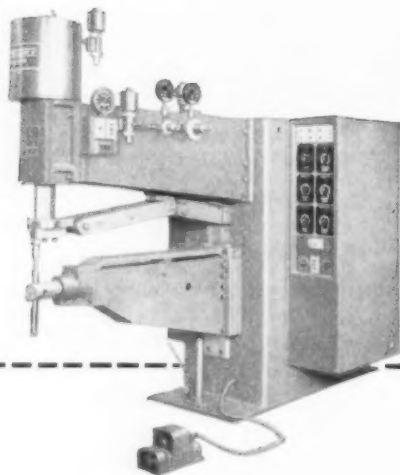
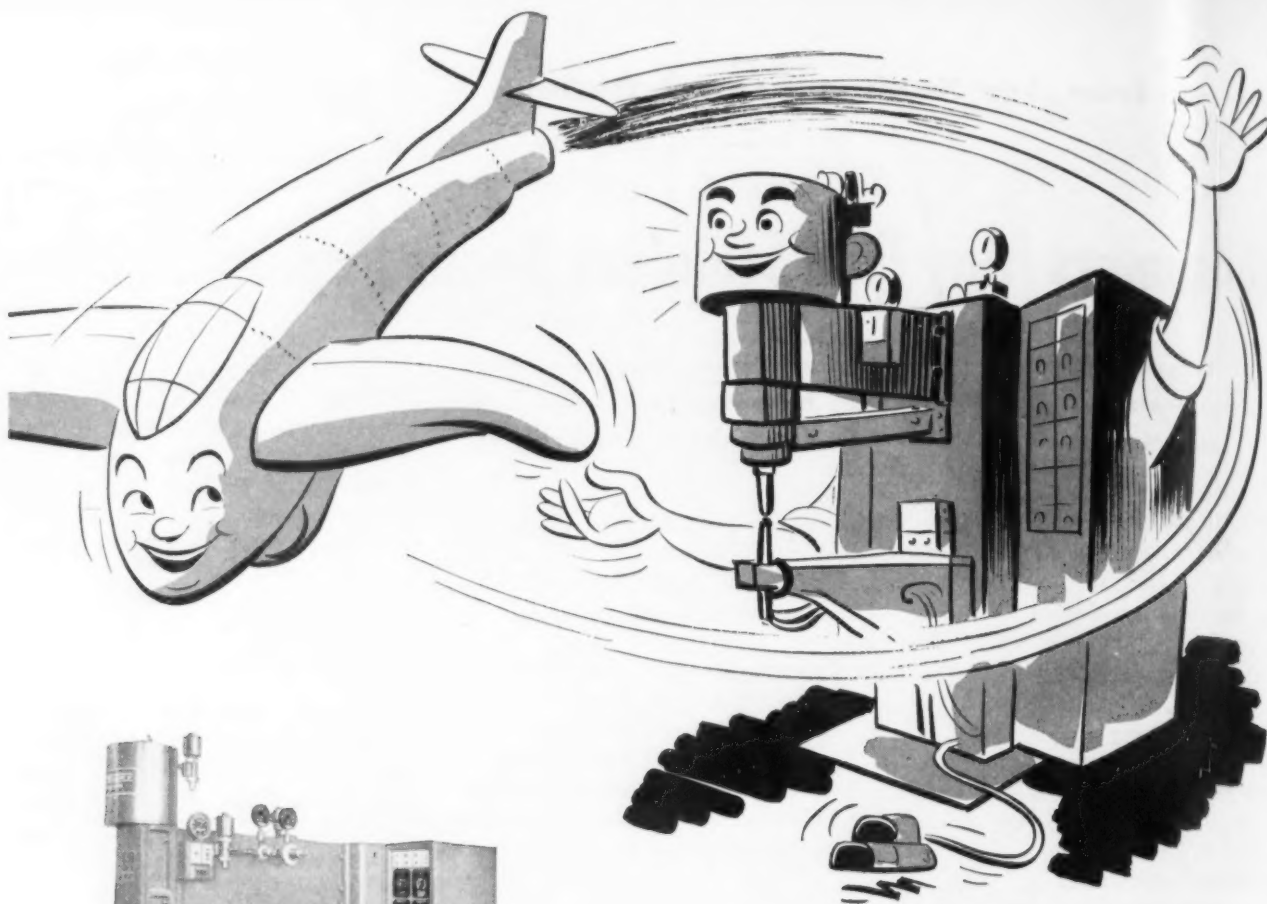
Although the mill would have no trouble getting rid of the steel, it is an annoying inconvenience. Furthermore, they feel it is unfair to the consumer, since the steel was being produced for his order. NPA says the mills are wrong. But where production was far along the mills have decided to ship and argue later.

It appears that NPA allotments are still way out of balance on hot-rolled sheets and bars. Allotments of structurals, cold-rolled sheets, rails and tinplate seem to be more in harmony with output.

Ingot Rate Up—Steelmaking operations this week are scheduled at 102 pct of rated capacity, up a point from the previous week.

It's a safe bet that the steel operating rate will hold well above theoretical capacity for some time—at least through October. Only labor trouble could wreck the forecast. October will probably be a record month.

Actually, if the steel industry's capacity were revised to take into account facilities installed or improved since the first of the year its operating rate would be slightly less than 100 pct of that capacity.



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Market Briefs

old but growing—Production of malleable iron foundries in 1951 must climb from 20 to 25 pct over last year to meet defense demands, it was revealed at the 125th anniversary meeting of the Malleable Founders' Society. The group met last week in Cleveland. The market for their products is growing. The tough, ductile, corrosion resistant castings will be fitted into tanks, planes, and nearly all ordnance equipment. While the defense load mounts, founders are searching earnestly for enough pig iron and scrap to keep going at top capacity. Founders say steelmakers now use more blast furnace pig iron for openhearth, thereby cutting down their supply.

crack-down—National Production Authority's get-tough policy toward commercial construction is reflected in this box-score on fourth-quarter building applications: 458 applications for materials approved; 2080 denied. The agency is taking a second look at 140 proposals and has given the green light to 848 others because they were exempt from controls.

employment—Iron and steel industries employed 678,200 people in July, a new record and 4000 more than June. The increase in a year has been over 3500. Average hourly wage payments rose to \$1.955 in the same month, the highest this year and 21.1¢ higher than in the first 7 months of 1950.

cleaner sales—Factory sales of standard size household vacuum cleaners in August totaled 191,299 units, an increase of 18.8 pct over July, according to industry wide figures announced by the Vacuum Cleaner Manufacturers' Assn. August sales compared to 341,232 units in August, 1950, a decrease of 43.9 pct.

quartz strike—General Services Administration has signed a contract to buy the entire output during the next 12 months of a new quartz strike in northern Utah. It's the first domestic source of quartz to meet government stockpile specifications. Up to now, foreign sources have supplied U. S. quartz needs. Brazil is the principal world producer.

no steel—Lack of steel is blamed by Porcelain Enamel Institute for a decline of \$3.5 million in second quarter shipments of porcelain enameled steel plumbing fixtures. However, second quarter shipments of \$15.2 million were still approximately 11 pct better than in the comparable 1950 period.

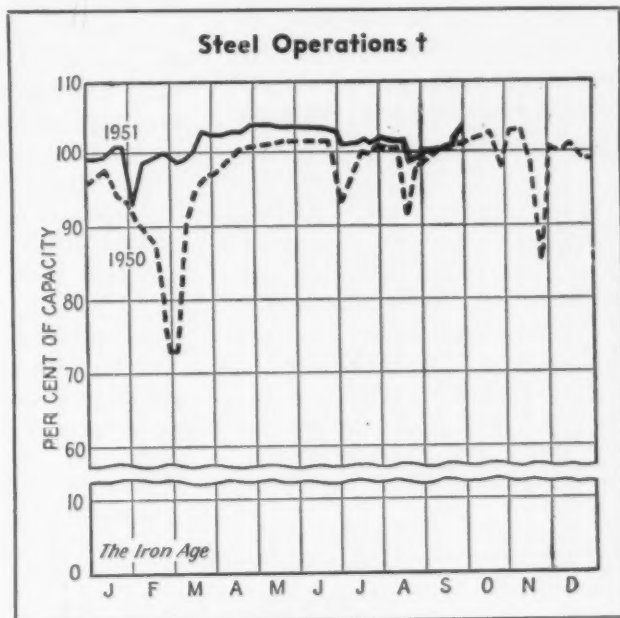
more steel—Jones and Laughlin Steel Corp. will tap the first heat of steel from its new Pittsburgh open hearth shop early next month. One of the 11 new furnaces will go into production at that time. Several others may be producing before year's end.

machine tool—Builders, their subcontractors, and their suppliers may now obtain government guaranteed loans for working capital inventory financing or expansion. The General Services Administration has announced they need not have actual government contracts to obtain these loans the GSA says.

purchase—H. K. Porter Co., Pittsburgh, has bought Buffalo Steel Co., Tonawanda, N. Y. The acquisition increases Porter's steel capacity to more than 200,000 tons. Buffalo, with a capacity of 70,000 tons, produces concrete reinforcing bars, merchant bars and other light steel products. Porter last October acquired Connors Steel Co., Birmingham, Ala.

tariff cut—Domestic users of imported abrasives will pay lower duties if legislation now being considered by the House Ways and Means Committee becomes law. Rep. William E. Miller, R., N. Y., is backing a bill (H. R. 5333) to reduce this tariff to \$1 per ton. Present rate discriminates against industries which must buy imported abrasive products, he says.

zinc duty—Suspension of import tariff on zinc is being considered in Washington by House Ways and Means Committee. Bill, which is backed by Rep. James T. Patterson, R., Conn., would cancel existing duties for 2 yr or for the duration of the present emergency.



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Sept. 16	99.0*	105.5	103.0*	101.0	100.0	104.0	98.0*	106.0	102.0*	97.5	93.5	93.0*	97.5	101.0
Sept. 23	99.0	105.0	103.0	101.0	102.0	104.0	95.5	106.0	102.0	104.0	96.0	86.0	117.0	102.0

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.

* Revised.

Nonferrous Markets

Scrap Shortage Laid to Everyone

Refiners, ingot makers, dealers, government blame each other . . . All must act . . . Brass strike off on news that WSB will hear dispute . . . Aluminum may move—By Bob Hatschek.

The metals scrap shortage was blamed on everybody else by speakers at the meeting of the National Assn. of Waste Material Dealers held last week-end. Ingot makers and secondary refiners blamed it on scrap dealers; dealers blamed it on poor collections and untapped supplies of dormant scrap; but everybody agreed in blaming the situation, at least in part, on the government's price and production agencies.

Nobody is wholly at fault and everybody connected with the situation has some blame to take. But what we need is scrap metal and talk won't produce it! No one should object to someone else trying to make a profit and everyone should do all in his power to produce more of the vital raw materials we need to defend our system from those who would destroy it.

Won't Boost Price — Ceiling Price Regulation 54 (aluminum scrap) may not have its bugs ironed out for some time. Office of Price Stabilization has told smelters and scrap dealers that it is not considering raising scrap aluminum prices and cannot see any need for it. OPS, of course, blames industry for the shortage,

claiming that persons with material are holding it up in anticipation of higher prices.

Smelters' representatives have asked the agency whether revisions to CPR 54 can be made to meet varied government practices in handling scrap and surplus aluminum, especially wrecked aircraft. Such a revision is being studied by OPS and other changes will probably be discussed again with industry before agreements can be reached.

Brass Strike Off — President Truman's decision to refer the issues to the Wage Stabilization Board was the reason CIO United Automobile Workers did not carry out their threat to strike on Monday. About 30,000 workers in the brass fabricating industry would have been affected. Defense Mobilizer Wilson had notified the White House that the country could not afford to lose any production from these mills which represent more than half of the industry.

Whose Move? — State officials and Congressmen from the Pacific Northwest are trying to block the threatened loss of not only projected aluminum facilities but

some existing potlines as well. A 20-year low in water levels has cut deeply into hydroelectric power generation and materials shortages have delayed new developments. Power priorities for atomic energy and the like are already set up and a brown-out is in the making.

Two courses exist: (1) Move some of the aluminum industry out or (2) build standby steam-power generating plants for supplementary use. Defense Chief Wilson has asked the industry for an estimate of the cost of the former and a House subcommittee was scheduled to conduct hearings on the latter this week.

Tin Markets Quiet—Reconstruction Finance Corp. and representatives of the Bolivian tin producers were scheduled to begin meetings on Monday. Object of the discussions is a long-term contract for tin concentrates from the South American source. At press time no details of the meeting were available.

Tin trading in London was extremely quiet but the Singapore price continued to fluctuate as both markets waited results of the U. S.-Bolivian get-together.

To Increase Supply — Defense Materials Procurement Agency has acted to assure increased supplies of zinc for the U. S. by signing a letter of intent with Volcan Mills Co., Lima, Peru, to buy the firm's entire mine output of zinc for the next 3 years. The government would buy half of the concentrates and the rest would be sold commercially for 17.5¢ a lb. Zinc content will total about 765 tons a month.

DMPA has also made an agreement with Copper Cities Mining Co. whereby the latter will increase production of its Gila, Ariz., mine to 22,500 tons a year. These facilities should start production in Oct., 1954.

NONFERROUS METAL PRICES

	Sept. 19	Sept. 20	Sept. 21	Sept. 22	Sept. 24	Sept. 25
Copper, electro, Conn. . . .	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered . . .	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York . . .	\$1.03	\$1.03	\$1.03	.....	\$1.03	\$1.03*
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	16.80	16.80	16.80	16.80	16.80	16.80

*Tentative

Note: Quotations are going prices.

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 31.0¢; 6S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 7S-O, 7S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 6S, 31S-O, 38.5¢; 6S, 36.6¢; 24S-O, 24S-OAL, 34.1¢; 7S-O, 7S-OAL, 41.8¢; 0.082 in., 2S, 3S, 32.9¢; 4S, 31S-O, 37.1¢; 6S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 7S-O, 7S-OAL, 52.2¢.

Plate 1/4 in. and heavier: 2S, 3S-F, 28.5¢; 6S-F, 30.2¢; 6S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 34S-OAL, 32.4¢; 7S-O, 7S-OAL, 38.5¢.

Extruded Solid Shapes: Shape factors 1 to 5, 16.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 36, 39.6¢ to 114¢; 36 to 38, 47.2¢ to 170¢.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 33.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-TS, 1/4 to 1 1/2 in., 53.5¢ to 42¢; 3/8 to 1 1/2 in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.6¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 6S, 45¢ to 35¢; 6S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 7S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 6S-S-T-5, OD in. 1 1/4 to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., 1.42¢; 96 in., 1.522¢; 120 in., 1.902¢; 144 in., 2.284¢. Gage 0.24 x 28 in., 72 in., 1.379¢; 96 in., 1.839¢; 120 in., 2.299¢; 144 in., 2.759¢. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, 1/4 in., 63¢; 3/16 in., 65¢; 1/8 in., 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, 1.05¢; 22, 1.12¢; 24, 1.17¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., 1/4 to 0.311 in., 74¢; 3/8 to 1/2 in., 67.5¢; 1/2 to 1.749 in., 53¢; 2 1/2 to 5 in., 48.5¢. Other alloys higher. Base Up to 1/4 in. diam, 10,000 lb; 1/4 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 69.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.3 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/4 lb, 10,000 lb, 1/4 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.067, 1/4 in. to 5/16, 1.40¢; 5/16 to 3/8, 1.26¢; 3/8 to 1/2, 99¢; 1 to 2 in., 76¢; 0.165 to 0.219, 1/4 to 3/4, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in. in.: Up to 1 1/2 in., 10,000 lb; 1 1/2 in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheet and strip, HR or CR, 115¢; Plate, HR, 112¢; Wire, rolled and/or drawn, 110¢; Bar, HR or forged, 86¢; Forgings, 86¢.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold rolled	77	60 1/2
Strip, cold-rolled	83	63 1/2
Rods and bars	73	58 1/2
Angles, hot-rolled	73	58 1/2
Plates	75	59 1/2
Seamless tubes	106	93 1/2
Shot and blocks	..	53 1/2

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68	..	41.28
Copper, h-r	..	37.53	..
Copper, drawn	..	38.78	..
Low brass	39.67	39.36	..
Yellow brass	38.28	37.97	..
Red brass	40.14	39.83	..
Naval brass	43.20	37.26	38.52
Leaded copper	..	41.58	..
Com'l bronze	41.13	40.82	..
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	..
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.82	52.04	..

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed 19.00
Aluminum pig 18.00
Antimony, American, Laredo, Tex., 42.00
Beryllium copper, 3.75-4.25% Be, \$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be.....\$69.00
Bismuth, ton lots.....\$2.25
Cadmium, del'd.....\$2.55
Cobalt, 97-99% (per lb).....\$2.10 to \$2.17
Copper, electro, Conn. Valley.....24.50
Copper, Lake, delivered.....24.625
Gold, U. S. Treas., dollars per oz.....\$35.00
Iridium, 99.8%, dollars per troy oz.....\$2.25
Iridium, dollars per troy oz.....\$200
Lead, St. Louis.....16.80
Lead, New York.....17.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.....24.50
Magnesium, sticks, 100 to 500 lb.....42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York.....\$215-\$221
Nickel electro, f.o.b. N.Y. warehouse 59.58
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel.....52.75
Palladium, dollars per troy oz.....\$24.00
Platinum, dollars per troy oz.....\$90 to \$93
Silver, New York, cents per oz.....90.16
Tin, New York.....\$1.03
Titanium, sponge.....\$5.00
Zinc, East St. Louis.....17.50
Zinc, New York.....18.29
Zirconium copper, 50 pct.....\$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot
No. 115.....27.25
No. 120.....26.75
No. 123.....26.25
80-10-10 ingot
No. 305.....32.25
No. 315.....30.25
88-10-2 ingot
No. 210.....40.00
No. 215.....38.50
No. 245.....33.50
Yellow ingot
No. 405.....23.25
Manganese bronze
No. 421.....29.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper, max.....20.6
0.60 copper, max.....20.4
Piston alloys (No. 122 type).....21.2
No. 12 alum. (No. 2 grade).....19.5
108 alloy.....20.6
195 alloy.....20.8
13 alloy.....20.8
ASX-679.....20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1-95-97 1/2%.....18.00
Grade 2-92-95%.....17.75
Grade 3-90-92%.....17.25
Grade 4-85-90%.....16.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper
Cast, oval, 15 in. or longer.....37.84
Electrodeposited.....33 1/2
Flat rolled.....38.34
Forged ball anodes.....43
Brass, 80-20
Cast, oval, 15 in. or longer.....34 1/2
Zinc, oval.....26 1/2
Ball anodes.....25 1/2
Nickel 99 pct plus
Cast.....76.00
Rolled, depolarized.....77.00
Cadmium.....\$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.97 1/2

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum.....63
Copper sulfate, 99.5 crystals, bbl.....12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed.....20 1/2
Nickel chloride, 375 lb drum.....27 1/2
Silver cyanide, 100 oz lots, per oz.....67 1/2
Sodium cyanide, 96 pct domestic 200 lb drums.....19.25
Zinc cyanide, 100 lb drum.....47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1/2¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21 1/2	20 1/2
Yellow Brass	19 1/2	17 1/2
Red brass	20 1/2	19 1/2
Comm. bronze	20 1/2	19 1/2
Mang. bronze	18 1/2	17 1/2
Brass rod ends	18 1/2	..

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75

Aluminum

Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18 1/2-19 1/2
No. 2 heavy copper and wire	17 1/2-17 3/4
Light copper	16-16 1/2
New type shell cuttings	16-16 1/2
Auto radiators (unsweated)	14 1/4-14 1/2
No. 1 composition	18-18 1/2
No. 1 composition turnings	17 1/2-18
Unlined red car boxes	16 1/2-17 1/2
Cocks and faucets	15 1/2-16
Mixed heavy yellow brass	12-12 1/2
Old rolled brass	15-15 1/2
Brass pipe	16-16 1/2
New soft brass clippings	16-16 1/2
Brass rod ends	15 1/2-16
No. 1 brass rod turnings	15-15 1/2

Aluminum

Alum. pistons and struts	6 1/2-7 1/2
Aluminum crankcases	7 1/2-8
2S aluminum clippings	10 1/2
Old sheet and utensils	7 1/2-8
Borings and turnings	5-6
Misc. cast aluminum	7 1/2-8
Dural clips (24S)	10-11

Zinc

New zinc clippings	12 1/4-12 3/4
Old zinc	9-9 1/2
Zinc routings	5-6
Old die cast scrap	5-6

Nickel and Monel

Pure nickel clippings	35-36
Clean nickel turnings	35-36
Nickel anodes	35-36
Nickel rod ends	35-36
New Monel clippings	28-29
Clean Monel turnings	20-21
Old sheet Monel	28-29
Nickel silver clippings, mixed	13-14
Nickel silver turnings, mixed	12-13

Lead

Soft scrap, lead	14-14 1/2
Battery plates (dry)	9 1/2-10

Magnesium

Segregated solids	15-16
Castings	14-15

Miscellaneous

Block tin	35-36
No. 1 pewter	60-65
No. 1 auto babbitt	48-50
Mixed common babbitt	16 1/2-16 3/4
Solder joints	23-24
Siphon tops	48-48
Small foundry type	20 1/2-21
Monotype	18 1/2-18 3/4
Lino. and stereotype	17 1/2-18
Electrotype	15-15 1/2
Hand picked type shells	8-9
Lino. and stereo. dross	8-9
Electro. dross	5-5 1/2

Scrap Prices

Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS, effective Feb. 7, 1951. Shipping point and delivered prices calculated as shown below.)

		Switching Charge (Dollars per gross ton) →																																														
		Pittsburgh	Johnstown	Brackbridge	Butler	Reading	Mt. Pleasant	Sharon	Youngstown	Canton	Steubenville	Warren	Wheaton	Cleveland	Buffalo	Cincinnati	Midtown	Chicago	Claymont	Conestoga	Conshohocken	Harrisburg	Phoenixville	Sparrows Pt.	Bedlehem	Ashland, Ky.	Kokomo, Ind.	Pertsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham	Alabama City	Atlanta	Minnequa	Houston	Los Angeles	Pittsburg, Cal.	Portland, Ore.	Seattle	San Francisco						
		\$0.89	.75	.53	.65	.75	.51	.75	.75	.61	.61	.70	.70	.76	.83	.65	.26	1.34	.79	.90	.20	.91	.51	.20	.52	.47	.51	.51	.51	.95	.50	.76	.50	.43	.51	.33	.57	.65	.65	.52	.59							
		Basing Points →																																														
GRADES	OPS No.																																															
No. 1 heavy melting	1	\$44.00							\$44.00					\$43.00				\$42.50		\$42.00					\$41.00		\$41.15		\$40.00		\$39.50		\$39.00		\$38.00		\$37.00		\$36.00		\$35.00		\$34.00		\$33.00			
No. 2 heavy melting	2	42.00							42.00					41.00				40.50		40.00					39.00		39.15		38.00		37.50		37.00		36.00		35.00		34.00		33.00		32.00		31.00		30.00	
No. 1 busheling	3	44.00							44.00					43.00				42.50		42.00					41.00		41.15		40.00		39.50		39.00		38.00		37.00		36.00		35.00		34.00		33.00		32.00	
No. 1 bundles	4	44.00							44.00					43.00				42.50		42.00					41.00		41.15		40.00		39.50		39.00		38.00		37.00		36.00		35.00		34.00		33.00		32.00	
No. 2 bundles	5	41.00							41.00					40.00				39.50		39.00					38.00		38.15		37.00		36.50		36.00		35.00		34.00		33.00		32.00		31.00		30.00			
Machine shop turnings	6	34.00							34.00					33.00				32.50		32.00					31.00		31.15		30.00		29.50		29.00		28.00		27.00		26.00		25.00		24.00		23.00			
Mixed borings and turnings	7	38.00							38.00					37.00				36.50		36.00					35.00		35.15		34.00		33.50		33.00		32.00		31.00		30.00		29.00		28.00		27.00			
Shovelling turnings	8	38.00							38.00					37.00				36.50		36.00					35.00		35.15		34.00		33.50		33.00		32.00		31.00		30.00		29.00		28.00		27.00			
Cast iron borings	10	38.00							38.00					37.00				36.50		36.00					35.00		35.15		34.00		33.50		33.00		32.00		31.00		30.00		29.00		28.00		27.00			
No. 1 chemical borings	26	41.00							41.00					40.00				39.50		39.00					38.00		38.15		37.00		36.50		36.00		35.00		34.00		33.00		32.00		31.00		30.00			
Forge crops	11	51.50							51.50					50.50				50.00		49.50					48.50		48.65		47.50		47.00		46.50		45.50		44.50		43.50		42.50		41.50		40.50			
Bar crops and plate	12	49.00							49.00					48.00				47.50		47.00					46.00		46.15		45.00		44.50		44.00		43.00		42.00		41.00		40.00		39.00		38.00			
Punchings and plate	14	46.50							46.50					45.50				45.00		44.50					43.50		43.65		42.50		42.00		41.50		40.50		39.50		38.50		37.50		36.50		35.50			
Electric furnace bundles	15	46.00							46.00					45.00				44.50		44.00					43.00		43.15		42.00		41.50		41.00		40.00		39.00		38.00		37.00		36.00		35.00			
Cut struct., plate, 3 ft and less	16	47.00							47.00					46.00				45.50		45.00					44.00		44.15		43.00		42.50		42.00		41.00		40.00		39.00		38.00		37.00		36.00			
Cut struct., plate, 2 ft and less	17	49.00							49.00					48.00				47.50		47.00					46.00		46.15		45.00		44.50		44.00		43.00		42.00		41.00		40.00		39.00		38.00			
Cut struct., plate, 1 ft and less	18	50.00							50.00					49.00				48.50		48.00					47.00		47.15		46.00		45.50		45.00		44.00		43.00		42.00		41.00		40.00		39.00			
Foundry steel, 2 ft and less	20	46.00							46.00					45.00				44.50		44.00					43.00		43.15		42.00		41.50		41.00		40.00		39.00		38.00		37.00		36.00		35.00			
Foundry steel, 1 ft and less	21	48.00							48.00					47.00				46.50		46.00					45.00		45.15		44.00		43.50		43.00		42.00		41.00		40.00		39.00		38.00		37.00			
Heavy trimmings	24	43.00							43.00					42.00				41.50		41.00					40.00		40.15		39.00		38.50		38.00		37.00		36.00		35.00		34.00		33.00		32.00			
No. 1 RR heavy melting	RR 1	46.00							46.00					45.00				44.50		44.00					43.00		43.15		42.00		41.50		41.00		40.00		39.00		38.00		37.00		36.00		35.00			
Scrap rails, random lengths	RR 14	48.00							48.00					47.00				46.50		46.00					45.00		45.15		44.00		43.50		43.00		42.00		41.00		40.00		39.00		38.00		37.00			
Scrap rails, 3 ft and less	RR 16	51.00							51.00					50.00				49.50		49.00					48.00		48.15		47.00		46.50		46.00		45.00		44.00		43.00		42.00		41.00		40.00			
Scrap rails, 2 ft and less	RR 17	52.00							52.00					51.00				50.50		50.00					49.00		49.15		48.00		47.50		47.00		46.00		45.00		44.00		43.00		42.00		41.00			
Scrap rails, 18 in. and less	RR 18	54.00							54.00					53.00				52.50		52.00					51.00		51.15		50.00		49.50		49.00		48.00		47.00		46.00		45.00		44.00		43.00			
Re-rolling rails	RR 15	53.00							53.00					52.00				51.50		51.00					50.00		50.15		49.00		48.50		48.00		47.00		46.00		45.00		44.00		43.00		42.00			
Uncut tires	RR 20	48.00							48.00					47.00				46.50		46.00					45.00		45.15		44.00		43.50		43.00		42.00		41.00		40.00		39.00		38.00		37.00			
Cut tires	RR 21	51.00							51.00					50.00				49.50		49.00					48.00		48.15		47.00		46.50		46.00		45.00		44.00		43.00		42.00		41.00		40.00			
Cut bolsters and side frames	RR 23	49.00							49.00					48.00				47.50		47.00					46.00		46.15		45.00		44.50		44.00		43.00		42.00		41.00		40.00		39.00		38.00			
RR specialties	RR 24, 26, 29	51.00							51.00					50.00				49.50		49.00					48.00		48.15		47.00		46.50		46.00		45.00		44.00		43.00		42.00		41.00		40.00			
Solid steel axles	RR 25	58.00							58.00					57.00				56.50		56.00					55.00		55.15		54.00		53.50		53.00		52.00		51.00		50.00		49.00		48.00		47.00			
No. 3 steel wheels	RR 27	51.00							51.00					50.00				49.50		49.00					48.00		48.15		47.00		46.50		46.00		45.00		44.00		43.00		42.00		41.00		40.00			

Cast Scrap

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	\$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y. cast	11	52.00

Celling price of clean cast iron foundry runouts or prepared cupola drops is 75 pct of corresponding grade.

SWITCHING DISTRICTS—These basing points include the indicated switching districts: Pittsburgh; Bessemer, Homestead, Duquesne, Munhall, Cincinnati; Newport, St. Louis; Granite City, East St. Louis, Madison, and Federal, Ill. San Francisco; South San Francisco; Niles, Oakland. Claymont; Chester. Chicago; Gary.

SHIPPING POINT PRICES (Except RR scrap)
 For shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is \$.25 per gross ton except: Memphis, 95¢; Great Lakes ports, \$1.50, and New England ports, \$1.75. Maximum shipping point price on No. 1 heavy melting steel in New York City is \$36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point. All New Jersey computations use all-rail transport. Ceiling need not fall below \$32 per gross ton for No. 1 heavy melting steel, with set differentials for other grades. Cast scrap shipping point prices are given in table.

DELIVERED PRICES (RR scrap) — Ceiling on-line price of a RR operating in a basing point is the top in the highest priced basing

point in which the RR operates. For off-line prices, RR's not operating in basing point, non-operating RR's, and RR scrap sold by someone other than a RR see text of order, THE IRON AGE, Feb. 8, 1951, p. 137-C.

DELIVERED PRICES (Except RR scrap)—
Ceiling is the shipping point price plus actual freight charge, tax included. Dock charges, where applicable, are as above.

UNPREPARED SCRAP—Ceiling price is \$8 a ton less than prepared base grades (No. 1 heavy & No. 1 RR heavy). Scrap suitable for compressing into No. 1 bundles is \$6 less than No. 1 bundles; suitable for compressing into No. 2 bundles, \$8 less than No. 2 bundles. For cast material requiring special preparation, price is breakable cast less preparation costs.

COMMISSIONS—Brokers are permitted a maximum of \$1 per gross ton commission which must be separate on the bill.

ALLOY PREMIUMS—These alloy extras are permitted: Nickel: \$1.25 may be added to price of No. 1 heavy for each 0.25 pct nickel between 1 and 5.25 pct. Molybdenum: \$2 may be added to price of No. 1 heavy for molybdenum over 0.15 pct, \$3 for content over 0.65 pct. Manganese: \$4 may be added to price of No. 1 heavy or No. 1 RR heavy for content over 10 pct if scrap is in sizes over 8 x 12 x 24 in., \$14 if less than 8 x 12 x 24 in. Manganese premium applicable only if sold for electric furnace use or on NPA allocation. Silicon: electric furnace and foundry grade adjustments are not applicable if silicon content is between 0.5 and 1.75 pct. Chromium: \$1 may be added if scrap conforms to SAE 52100 analysis. Multiple Alloys: if scrap contains two premium alloy elements, total premium may not exceed ceiling premium for any one contained alloy.

RESTRICTIONS ON USE—Ceiling prices on some scrap items may fluctuate with use by consumers. If some scrap is purchased for its established specialized use, the ceiling price set in the order stands. But if some special grades are purchased for other uses, the ceiling price charge shall be the price of the scrap grade being substituted. For example, the price established for Grade 25 (wrought iron) may be charged only when sold to a producer of wrought iron. Otherwise the ceiling price shall not exceed the ceiling price for the corresponding grade of basic openhearth. Re-

restrictions in use are placed on the following grades: Chemical borings, wrought iron and re-rolling rails, cupola cast, billet, bloom, and forge crops, Nos. 1 and 2 chemical borings. Ceiling prices on billet bloom and forge crops, alloy-free turnings, and heavy turnings may be charged only when shipped directly from industrial producer. NPA prohibits openhearth users from buying electric furnace grades, Nos. 11 through 18, foundry grades, Nos. 20 and 21 and cast grades, 1, 7, 9 and 11.

CEILING INTRANSIT PREPARATION CHARGES (Dollars per gross ton)

No. 1 heavy; No. 2 heavy; No. 1 RR heavy; No. 2 RR heavy; No. 1 busheling; No. 2 bundles; electric furnace bundles.	8.00
No. 1 bundles; briquetted turnings or cast iron borings; No. 1 RR sheet scrap.....	6.00
Crushing machine shop turnings.....	8.00
Bar crops and plate, cast steel, punchings and plate, cut structural and plate, 3 ft and under, foundry steel, 2 ft and under, wrought iron	10.00
Structural, plate scrap, 2 ft and less, foundry steel 1 ft and less.....	11.00
Structural and plate scrap, 1 ft and less	12.00
Rails, 3 ft & less; cut tires; cut bolsters & side frames	4.00
Rails, 2 ft & less	5.00
Rails, 18 in. & less	7.00

Hamilton, Ontario

(Consumers buying prices, del'd gross ton)

Hvy. melting steel	\$95.00
No. 1 bundles	85.00
No. 2 bundles	34.50
Mechanical bundles	33.00
Mixed, steel scrap	31.00
Rails, remelting	35.00
Rails, rerolling	38.00
Bushellings	29.50
Bushellings, prepared new factory	33.00
Bushellings, unprepared new factory	28.00
Short steel turnings	28.00
Mixed borings, turnings	28.00
Cast scrap	58.00 to 60.00

Iron and Steel Scrap Markets

The Case Against Scrap Upgrading

Its impact is most forcible now in shortage . . . Free scrap seized by upgraders, leaving rest of field at sidelines . . . Need single price for openhearth grades . . . Big users hurt.

Upgrading of lower class iron and steel material into higher echelons of scrap to get top prices is coming into almost total disrepute. Apologists for the system have called it a necessary evil. They said it was needed as a market stimulus, compensating for price controls when it was vitally necessary.

But the tune is changing. Upgrading hurts most today. The scrap supply outside National Production Authority's allocations empire is sparse and those with the means to upgrade can thoroughly clean out almost all free scrap in a district. With supplies more plentiful, upgrading did not have such obvious results.

Left staring indignantly from the sidelines are mills, dealers, brokers who normally disdain upgrading or who have temporarily dropped it. Necessity also sometimes masters scruples and mills must sometimes accept or dealers collect upgraded material. The most bitter complaints come from the big scrap consumers and their scrap trade representatives who have too much to lose by playing at upgrading.

NPA has shown a few futile flashes of enthusiasm in trying to curb upgrading but it is generally admitted that NPA enforcement is inadequate.

Scrap men and steel men say that the problem is serious and is turning the market topsy turvy.

Since NPA has failed in halting the practice, all that remains is to rig the price control set-up so that it dies a natural death. If it has been suggested once on this page, merging of the five openhearth grades at a single price has been suggested 50 times. Previous pitfall to agreement be-

tween consumers and scrap men has been the single price.

Scrap men want it to be the price of No. 1 heavy—\$44, Pittsburgh. Now some large scrap consumers are willing. Upgrading is lambasting their scrap collection chances. The request for the single openhearth classification has been lodged with OPS and now the trade is waiting for Lefty. He's notoriously slow.

Pittsburgh — Upgrading continues to be a serious problem in the Pittsburgh district. Evidently OPS has not been able to do an adequate enforcement job. Although no mill will admit paying No. 1 heavy melting price for an inferior grade, it is going on. Mills that try to stick to the rules are being hurt. Generally, the supply picture here is deteriorating. A leading mill that 5 weeks ago had a 15-days' supply, is now down to less than a week.

Chicago — Outlying mills in the district are having considerably more trouble maintaining inventory. One electric furnace producer is reported to have recently received a considerable number of allocations to help them out of serious trouble. A remote openhearth producer's inventory is little better than a week. Local mills are better off than some others.

Philadelphia — Supply here for all grades continues on a hand-to-mouth basis, with just enough scrap available for immediate needs. There still is little or no chance to build up stockpiles. Steel remains very tight. Allocations are about the same, with substantial quantities moving West.

New York — Some sources here reported cast as a little stronger and giving signs of further strengthening. Several complaints came in that agents for mills with a green light on upgrading are able to snatch up the little free scrap that is available.

Detroit — October scrap lists continue to reflect the declining auto production rate and the volume of industrial tonnage moving to steel mills is expected to show a noticeable drop. Meanwhile, there are indications that the scrap drive in auto plants is beginning to gather steam. Considerable paper work will have to be done before scrapped tools and dies and fixtures can become a scrap factor.

Cleveland — The scrap situation in this area is growing worse. Good weather has aided flow to mills but prospects for future continued deliveries are not bright. No mills ready to shut down but there's growing anxiety for October later. Some dormant plant scrap is beginning to show up as result of Mobilization Day drive but yards here are still "clean."

St. Louis — Scrap movement to the industrial district here improved slightly. Cause could have been stepped-up auto graveyard collections. Farm scrap is slow. Truckers are devoting their time to hauling coal and farmers are busy, anyway. Railroad lists are small.

Birmingham — The scrap situation here is unchanged. Very little is coming into the district and this is being delivered as soon as it arrives. Most concerns in the district report they are down to less than 30 days supply, some of them as little as 2 weeks.

Cincinnati — Traffic in all but cast grades has changed little over the past 2 to 3 weeks. However good cast is becoming tighter. One dealer here feels that enough scrap will be generated by increased defense plant production to offset winter squeeze. This optimism is not shared by all, particularly since labor is becoming more of a problem.

Boston — Scrap continues to move in large quantities in an active market. Cast is not as widely bought. Dealers still feel there will be a clarification on water rates, but at the moment there is only shipment by rail.

Buffalo — Sizeable shipments were again going to local mills as out-of-area allocations were reduced considerably. Mills here now have about a 5 to 6 weeks supply of scrap. Water shipments were light.

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(cents per pound)	1951	1951	1951	1950
Hot-rolled sheets	3.60	3.60	3.60	3.35
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	34.50

Tin and Ternplate:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(dollars per base box)				
Tinplate (1.50 lb.) cokes	\$8.70	\$8.70	\$8.70	\$7.50
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	6.60
Special coated mfg. ternes	7.50	7.50	7.50	6.35

Bars and Shapes:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(cents per pound)				
Merchant bars	3.70	3.70	3.70	3.45
Cold finished bars	4.55	4.55	4.55	4.145
Alloy bars	4.30	4.30	4.30	3.95
Structural shapes	3.65	3.65	3.65	3.40
Stainless bars (No.302)	31.50	31.50	31.50	30.00
Wrought iron bars	9.50	9.50	9.50	9.50

Wire:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(cents per pound)				
Bright wire	4.85	4.85	4.85	4.50

Rails:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(dollars per 100 lb)				
Heavy rails	\$3.60	\$3.60	\$3.60	\$3.40
Light rails	4.00	4.00	4.00	3.75

Semifinished Steel:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(dollars per net ton)				
Rerolling billets	\$56.00	\$56.00	\$56.00	\$54.00
Slabs, rerolling	56.00	56.00	56.00	54.00
Forging billets	66.00	66.00	66.00	63.00
Alloy blooms billets, slabs	70.00	70.00	70.00	66.00

Wire Rod and Skelp:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(cents per pound)				
Wire rods	4.10	4.10	4.10	3.85
Skelp	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(per gross ton)				
No. 2 foundry, del'd Phila.	\$57.77	\$57.77	\$57.77	\$51.76
No. 2, Valley furnace	52.50	52.50	52.50	49.50
No. 2, Southern Cin'ti.	55.58	55.58	55.58	50.25
No. 2, Birmingham	48.88	48.88	48.88	43.55
No. 2, foundry, Chicago†	52.50	52.50	52.50	49.50
Basic del'd Philadelphia	56.92	56.92	56.92	50.92
Basic, Valley furnace	52.00	52.00	52.00	49.00
Malleable, Chicago†	52.50	52.50	52.50	49.50
Malleable, Valley	52.50	52.50	52.50	49.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese†	186.25	186.25	186.25	173.40

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(per gross ton)				
No. 1 steel, Pittsburgh	\$44.00*	\$44.00*	\$44.00*	\$43.75
No. 1 steel, Phila. area	42.50*	42.50*	42.50*	38.50
No. 1 steel, Chicago	42.50*	42.50*	42.50*	39.75
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	37.25
Low phos. Young'n.	46.50*	46.50*	46.50*	46.25
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	51.75
No. 1 cast, Philadelphia	49.00†	49.00†	49.00†	46.50
No. 1 cast, Chicago	49.00†	49.00†	49.00†	50.50

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.

Coke: Connellsville:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(per net ton at oven)				
Furnace coke, prompt	\$14.75	\$14.75	\$14.75	\$14.25
Foundry coke, prompt	17.75	17.75	17.75	16.25

Nonferrous Metals:	Sept. 25, 1951	Sept. 18, 1951	Aug. 28, 1951	Sept. 26, 1950
(cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	23.80
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	\$1.03†	\$1.03	\$1.03	\$1.04
Zinc, East St. Louis	17.50	17.50	17.50	17.50
Lead, St. Louis	16.80	16.80	16.80	15.80
Aluminum, virgin	19.00	19.00	19.00	18.25
Nickel, electrolytic	59.58	59.58	59.58	51.22
Magnesium, ingot	24.50	24.50	24.50	22.50
Antimony, Laredo, Tex.	42.00	42.00	42.00	32.00

†Tentative.

Composite Prices

Finished Steel Base Price

Sept. 25, 1951	4.131¢ per lb.
One week ago	4.131¢ per lb.
One month ago	4.131¢ per lb.
One year ago	3.837¢ per lb.

	High	Low
1951....	4.131¢ Jan. 2	4.131¢ Jan. 2
1950....	4.131¢ Dec. 1	3.837¢ Jan. 3
1949....	3.837¢ Dec. 27	3.3705¢ May 3
1948....	3.721¢ July 27	3.193¢ Jan. 1
1947....	3.193¢ July 29	2.848¢ Jan. 1
1946....	2.848¢ Dec. 31	2.464¢ Jan. 1
1945....	2.464¢ May 29	2.396¢ Jan. 1
1944....	2.396¢	2.396¢
1943....	2.396¢	2.396¢
1942....	2.396¢	2.396¢
1941....	2.396¢	2.396¢
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939....	2.35367¢ Jan. 3	2.26689¢ May 16
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1932....	1.89196¢ July 5	1.83910¢ Mar. 1
1929....	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Pig Iron

....\$52.69 per gross ton....
.... 52.69 per gross ton....
.... 52.69 per gross ton....
.... 46.61 per gross ton....

	High	Low
\$52.69 Jan. 2	\$52.69 Jan. 2	
52.69 Dec. 12	45.88 Jan. 3	
46.87 Jan. 18	45.88 Sept. 6	
46.91 Oct. 12	39.58 Jan. 6	
37.98 Dec. 30	30.14 Jan. 7	
30.14 Dec. 10	25.37 Jan. 1	
25.37 Oct. 23	23.61 Jan. 2	
	\$23.61	
	23.61	
	23.61	
\$23.61 Mar. 20	\$23.45 Jan. 2	
23.45 Dec. 23	22.61 Jan. 2	
22.61 Sept. 19	20.61 Sept. 12	
23.25 June 21	19.61 July 6	
32.25 Mar. 9	20.25 Feb. 16	
19.74 Nov. 24	18.73 Aug. 11	
14.81 Jan. 5	13.56 Dec. 6	
18.71 May 14	18.21 Dec. 17	

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel

....\$43.00 per gross ton....
.... 43.00 per gross ton....
.... 43.00 per gross ton....
.... 40.67 per gross ton....

	High	Low
\$47.75 Jan. 30	\$43.00 Feb. 7	
45.13 Dec. 19	26.25 Jan. 3	
43.00 Jan. 4	19.33 June 28	
43.16 July 27	39.75 Mar. 9	
42.58 Oct. 28	29.50 May 20	
31.17 Dec. 24	19.17 Jan. 1	
19.17 Jan. 2	18.92 May 22	
19.17 Jan. 11	15.76 Oct. 24	
	\$19.17	
	19.17	
\$22.00 Jan. 7	\$19.17 Apr. 10	
21.83 Dec. 30	16.04 Apr. 9	
22.50 Oct. 3	14.08 May 16	
15.00 Nov. 22	11.00 June 7	
21.92 Mar. 30	12.67 June 9	
17.75 Dec. 21	12.67 June 8	
8.50 Jan. 12	6.43 July 6	
17.58 Jan. 29	14.08 Dec. 8	

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Heavy
Sept. 26
1950
\$51.76
49.50
50.25
43.55
49.50
50.92
49.00
49.50
49.50
70.56
173.40
the Chi-

\$43.75
38.50
39.75
37.25
46.25
51.75
46.50
50.50

\$14.25
16.25

23.80
24.625
\$1.04
17.50
15.80
18.25
51.22
22.50
32.00

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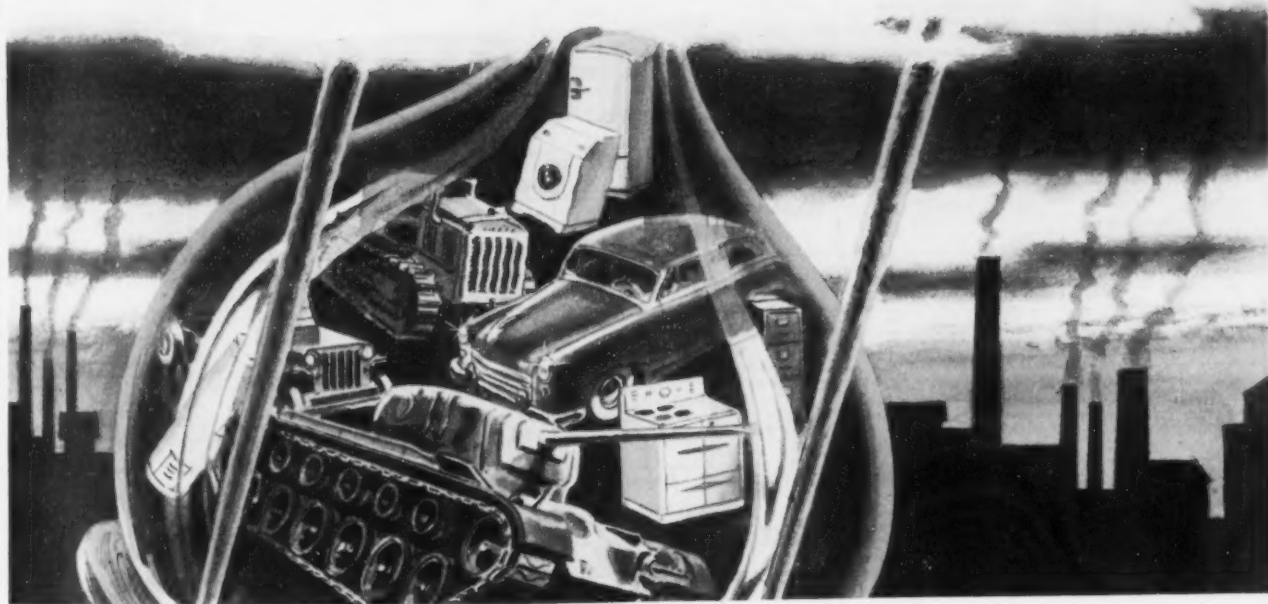
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COUNT**



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LURIA BROTHERS AND COMPANY, INC.**

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READING, PENNA.
DETROIT (ECORSE),
MICHIGAN
MODENA, PENNA.
PITTSBURGH, PENNA.
ERIE, PENNA.

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BIRMINGHAM, ALA. Empire Building	CHICAGO, ILLINOIS 100 W. Monroe St.	HOUSTON, TEXAS 1114 Texas Av. Bldg.	PITTSBURGH, PA. Oliver Building
BOSTON, MASS. Statler Building	CLEVELAND, OHIO 1022 Midland Bldg.	LEBANON, PENNA. Luria Building	PUEBLO, COLORADO 334 Colorado Bldg.
BUFFALO, N. Y. Genesee Building	DETROIT, MICHIGAN 2011 Book Building	NEW YORK, N. Y. 100 Park Avenue	READING, PENNA. Luria Building
ST. LOUIS, MISSOURI Railway Exchange Bldg.	SAN FRANCISCO, CALIFORNIA 300 Montgomery St.	SEATTLE, WASH. Smith Tower	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

September 27, 1951

IRON AGE

STEEL
PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middle- town	Youngs- town	Bethle- hem	Buffalo	Consho- hocken	Johns- town	Spar- rows Point	Granite City	Detroit
INGOTS														
Carbon forging, net ton	\$52.00 ¹													
Alloy, net ton	\$54.00 ¹⁻¹⁷													\$54.00 ¹¹
BILLETS, BLOOMS, SLABS														
Carbon, rerolling, net ton	\$56.00 ¹⁻⁵	\$56.00 ¹	\$56.00 ¹						\$56.00 ³		\$56.00 ³			
Carbon forging billets, net ton	\$66.00 ¹⁻⁵	\$66.00 ¹⁻⁴	\$66.00 ¹	\$66.00 ⁴	\$66.00 ⁴				\$66.00 ³⁻⁴	\$73.00 ³	\$66.00 ³			\$66.00 ¹¹
Alloy, net ton	\$70.00 ¹⁻¹⁷⁻⁶	\$70.00 ¹⁻⁴	\$70.00 ¹⁻⁶		\$70.00 ⁴			\$70.00 ³	\$70.00 ³⁻⁴	\$77.00 ³	\$70.00 ³			\$73.00 ¹¹
PIPE SKELP	3.35 ¹ 3.45 ⁵						3.35 ¹⁻⁴							
WIRE RODS	4.10 ² 4.30 ¹⁻⁸	4.10 ²⁻⁴⁻³³	4.10 ⁶	4.10 ²			4.10 ⁶		4.10 ³⁻⁵		4.10 ²	4.20 ³		
SHEETS														
Hot-rolled (18 ga. & hvr.)	3.60 ¹⁻⁵⁻⁹⁻¹⁸ 3.75 ²⁻⁸	3.60 ³⁻³³	3.60 ¹⁻⁶⁻⁸	3.60 ⁴⁻⁵		3.60 ⁷	3.60 ¹⁻⁴⁻⁸ 4.00 ¹⁻⁸		3.60 ³	4.00 ²⁻⁸		3.60 ³	4.30 ³³	3.60 ¹⁻² 4.40 ¹⁻⁷
Cold-rolled	4.35 ¹⁻⁵⁻⁹⁻¹⁸⁻⁷		4.35 ¹⁻⁶⁻⁸	4.35 ⁴⁻⁵		4.35 ⁷	4.35 ⁴⁻⁸		4.35 ³			4.35 ³	5.05 ³³	4.55 ¹⁻²
Galvanized (10 gage)	4.80 ¹⁻⁹⁻¹⁸		4.80 ¹⁻⁸		4.80 ⁴	4.80 ⁷	5.50 ⁴⁻⁸ 6.00 ⁴⁻⁸					4.80 ³	5.50 ³³	
Enameling (12 gage)	4.65 ¹		4.65 ¹⁻⁸	4.65 ⁴		4.65 ⁷	4.65 ⁸						5.35 ³³	
Long tens (10 gage)	5.20 ⁹⁻¹⁸		5.20 ¹			5.20 ⁷	5.00 ⁴⁻⁸							
Hi str. low alloy, h.r.	5.40 ¹⁻⁵ 5.75 ²	5.40 ¹	5.40 ¹⁻⁸ 5.90 ⁶	5.40 ⁴⁻⁵			5.40 ¹⁻⁴⁻¹⁸ 5.90 ⁶		5.40 ³	5.65 ³⁻⁸		5.40 ³		5.95 ¹⁻²
Hi str. low alloy, c.r.	6.55 ¹⁻⁵ 6.90 ⁶		6.55 ¹⁻⁸ 7.05 ⁶	6.55 ⁴⁻⁵			6.55 ⁴ 7.05 ⁶		6.55 ³			6.55 ³		7.10 ¹⁻²
Hi str. low alloy, galv.	7.20 ¹											6.75 ³		
STRIP														
Hot-rolled	3.60 ⁹ , 4.00 ⁴⁻¹¹ 3.80 ²⁻⁷	3.50 ⁴⁻⁶	3.60 ¹⁻⁶⁻⁸			3.50 ⁷	3.50 ¹⁻⁴⁻⁸ 4.00 ¹⁻²		3.50 ³⁻⁴	3.90 ³⁻⁸	3.50 ³	3.50 ³		4.40 ¹⁻⁷ 3.80 ¹⁻²
Cold-rolled	4.65 ²⁻⁷⁻⁹ 5.00 ²⁻⁸ 5.35 ⁴⁻⁶⁻⁸⁻⁹⁻³³	4.90 ³⁻⁶⁻⁸	4.90 ³	4.65 ²⁻⁵		4.65 ⁷	4.65 ⁴⁻⁸ 5.25 ⁴⁻⁸⁻¹⁰ 5.35 ¹⁻²⁻⁶⁻⁹		4.65 ³			4.65 ³		4.85 ¹⁻² 5.45 ¹⁻⁷ 5.60 ³⁻⁸⁻¹¹
Hi str. low alloy, h.r.	5.75 ⁹		5.50 ¹ 5.30 ³⁻⁶⁻⁸⁻⁹				4.95 ⁴⁻⁵ 5.40 ¹⁻³ , 5.80 ⁶ (6.20 ⁴ , 6.55 ¹⁻³)		4.95 ³	5.55 ³⁻⁸		4.95 ³		5.95 ¹⁻²
Hi str. low alloy, c.r.	7.20 ⁹			6.55 ² (6.70 ⁵)					6.40 ³			6.40 ³		
TINPLATE ¹	\$8.45 ¹⁻⁵⁻⁹⁻¹⁸		\$8.45 ¹⁻⁶⁻⁸				\$8.45 ⁴					\$8.55 ³		
Cokes, 1.25-lb base box (1.50 lb, add 25¢)														
Electrolytic 0.25, 0.50, 0.75 lb box														
BLACKPLATE, 29 gage Hollowware enameling	5.85 ¹ 6.15 ¹⁻⁵		5.85 ¹				5.30 ⁴							
BARS														
Carbon steel	3.70 ¹⁻⁵ 3.85 ²	3.70 ¹⁻⁴⁻³³	3.70 ¹⁻⁴⁻⁶⁻⁸	3.70 ⁴	3.70 ⁴		3.70 ¹⁻⁴⁻⁸		3.70 ³⁻⁴		3.70 ³			3.85 ¹⁻² 4.80 ¹⁻⁶⁻⁹
Reinforcing	3.70 ¹⁻⁵	3.70 ⁴	3.70 ¹⁻⁶⁻⁸	3.70 ⁴			3.70 ¹⁻⁴⁻⁸		3.70 ³⁻⁴		3.70 ³	3.70 ³		
Cold-finished	4.55 ²⁻⁴⁻⁵⁻⁶⁻⁷⁻¹¹	4.55 ²⁻³³⁻⁷⁰	4.55 ⁴⁻⁷⁻⁸	4.55 ²	4.55 ⁴⁻⁸⁻²		4.55 ⁶⁻⁷		4.60 ⁷⁻⁹					4.70 ⁴
Alloy, hot-rolled	4.30 ¹⁻¹⁷	4.30 ¹⁻⁴⁻³³	4.30 ¹⁻⁶⁻⁸		4.30 ⁴		4.30 ¹⁻⁸	4.30 ⁶	4.30 ³⁻⁴		4.30 ³			4.45 ¹⁻² 4.85 ¹⁻³
Alloy, cold-drawn	5.40 ¹⁻⁷⁻³² 6.9-7.1-3	5.40 ⁴⁻²³⁻⁶⁰ 7.0-7.3 5.45 ²	5.40 ⁴⁻⁷⁻⁸ 7.4		5.40 ⁴⁻³³		5.40 ⁶⁻²⁵⁻⁵⁷	5.40 ⁵	5.40 ³					5.55 ⁴ 5.60 ¹⁻⁶⁻⁹
Hi str. low alloy, h.r.	5.55 ¹⁻⁵		5.55 ¹⁻⁸ 6.05 ⁶	5.55 ⁴⁻⁵			5.55 ¹ 6.05 ⁶	5.55 ³	5.55 ³		5.55 ³			
PLATE														
Carbon steel	3.70 ¹⁻⁵⁻¹⁸ 4.00 ⁹	3.70 ¹⁻²³	3.70 ¹⁻⁶⁻⁸	3.70 ⁴⁻⁵			3.70 ¹⁻⁴⁻⁶ 3.95 ¹⁻³		3.70 ³	4.15 ³⁻⁸	3.70 ³	3.70 ³	4.40 ³³	
Floor plates	4.75 ¹	4.75 ¹	4.75 ³	4.75 ⁵						4.75 ³⁻⁸				
Alloy	4.75 ¹	4.75 ¹	4.75 ¹				5.20 ¹⁻³			5.05 ³⁻⁸	4.75 ³	4.75 ³		
Hi str. low alloy	5.65 ¹⁻⁵	5.65 ¹	5.65 ¹⁻⁸ 6.15 ⁶	5.65 ⁴⁻⁵			(5.65 ⁴ 5.70 ¹⁻³ 6.15 ⁶)			5.90 ³⁻⁸	5.65 ³	5.65 ³		
SHAPES, Structural	3.65 ¹⁻⁵ 3.90 ⁶	3.65 ¹⁻³³	3.65 ¹⁻⁸					3.70 ³	3.70 ³		3.70 ³			
Hi str. low alloy	5.50 ¹⁻⁵	5.50 ¹	5.50 ¹⁻⁸ 6.00 ⁶				6.00 ⁶	5.50 ³	5.50 ³		5.50 ³			
MANUFACTURERS' WIRE														
Bright	4.85 ²⁻⁵ 5.10 ¹⁻⁸	4.85 ² 4.33-3.4		4.85 ²			4.85 ⁶	Kokomo = 4.95 ²⁻⁹ 4.85 ⁶			4.85 ³	4.95 ³	Duluth = 4.85 ³	
PILING, Steel Sheet	4.45 ¹	4.45 ¹	4.45 ³						4.45 ¹					

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extr. apply.

IRON AGE				STEEL PRICES	
Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F = \$79.00 ¹⁹	INGOTS	Carbon forging, net ton
	\$62.00 ¹⁰		F = \$80.00 ¹⁹	Alloy, net ton	
		\$56.00 ¹¹	F = \$75.00 ¹⁹	BILLETS, BLOOMS, SLABS	Carbon, re-rolling, net ton
	\$74.00 ¹²	\$66.00 ¹¹	F = \$85.00 ¹⁹ SF, LS, S = \$85.00 ¹²	Carbon forging billets, net ton	
	\$78.00 ¹²		F = \$89.00 ¹⁹ LA = \$90.00 ¹²	Alloy net ton	
				PIPE SKELP	
	4.50 ¹²	4.10 ¹¹	SF = 4.90 ¹² , F = 4.90 ¹⁹ LA = 4.90 ¹² , 4.63	WIRE RODS	
		3.80 ¹¹	SF, LA = 4.30 ¹⁴ F = 4.55 ¹⁹	SHEETS	Hot-rolled (18 ga. & hvr.)
		4.35 ¹¹	SF = 5.30 ¹⁴ F = 5.30 ¹⁹	Cold-rolled	
		4.80 ¹¹	SF, LA = 5.55 ¹⁴	Galvanized (10 gage)	
				Enameling (12 gage)	
		5.40 ¹¹	F = 6.35 ¹⁹	Long tennet (10 gage)	
			F = 7.50 ¹⁹	Hi str. low alloy, h.r.	
				Hi str. low alloy, c.r.	
				Hi str. low alloy, galv.	
4.10 ¹²	4.90 ¹²	3.50 ¹¹	SF, LA = 4.25 ¹⁴ , 4.12 F = 4.75 ¹⁹ , S = 4.50 ¹²	STRIP	Hot-rolled
			F = 6.30 ¹⁹ LA = 6.40 ¹⁷	Cold-rolled	
		5.30 ¹¹	F = 6.20 ¹⁹ SF, LA = 6.05 ¹² S = 6.30 ¹²	Hi str. low alloy, h.r.	
			F = 6.95 ¹⁹	Hi str. low alloy, c.r.	
			\$8.55 ¹¹ SF = 9.20 ¹⁴	TINPLATE	Cokes, 1.25-lb base box (1.50 lb. add 25¢)
				Electrolytic	0.25, 0.50, 0.75 lb box
4.30 ¹²	4.10 ¹²	3.70 ¹¹	SF, LA = 4.40 ¹⁴	BLACKPLATE, 29 gage	Hollowware enameling
4.30 ¹²	4.10 ¹²	3.70 ¹¹	SF, S = 4.45 ¹² F = 4.40 ¹⁹ , LA = 4.40 ¹²	BARS	Carbon steel
			LA = 6.00 ¹⁴	Reinforcing	
4.90 ¹²	4.70 ¹²		LA = 5.35 ¹² F = 5.35 ¹⁹	Cold-finished	
				Alloy, hot-rolled	
				Alloy, cold-drawn	
		5.55 ¹¹	F = 6.00 ¹⁹ SF, S = 6.30 ¹² LA = 6.25 ¹²	Hi str. low alloy, h.r.	
	4.10 ¹²	3.70 ¹¹	F = 4.30 ¹⁹ S = 4.60 ¹²	PLATE	Carbon steel
				Floor plates	
			F = 5.70 ¹⁹	Alloy	
		5.65 ¹¹	F = 6.25 ¹⁹ S = 6.55 ¹²	Hi str. low alloy	
4.25 ¹²	4.05 ¹²	3.60 ¹¹	SF = 4.20 ¹² F = 4.25 ¹⁹ LA = 4.25 ¹² , 4.12 S = 4.30 ¹²	SHAPES, Structural	
		5.50 ¹¹	SF = 6.10 ¹² , 5.19 SF = 6.00 ¹² LA = 6.05 ¹²	Si str. low alloy	
5.45 ¹²	5.25 ¹²	4.85 ¹¹	SF, LA = 5.80 ¹⁴	MANUFACTURERS' WIRE	Bright

†Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate, 55 to 125-lb, deduct \$2.20 from 1.25-lb coke base box.

Key to Steel Producers

- U. S. Steel Co., Pittsburgh
- American Steel & Wire Co., Cleveland
- Bethlehem Steel Co., Bethlehem
- Republic Steel Corp., Cleveland
- Jones & Laughlin Steel Corp., Pittsburgh
- Youngstown Sheet & Tube Co., Youngstown
- Armco Steel Corp., Middletown, Ohio
- Inland Steel Co., Chicago
- Weirton Steel Co., Weirton, W. Va.
- National Tube Co., Pittsburgh
- Tennessee Coal, Iron & R. R. Co., Birmingham
- Great Lakes Steel Corp., Detroit
- Sharon Steel Corp., Sharon, Pa.
- Colorado Fuel & Iron Corp., Denver
- Wheeling Steel Corp., Wheeling, W. Va.
- Geneva Steel Co., Salt Lake City
- Crucible Steel Co. of America, New York
- Pittsburgh Steel Co., Pittsburgh
- Kaiser Steel Corp., Oakland, Calif.
- Portsmouth Div., Detroit Steel Corp., Detroit
- Lukens Steel Co., Coatesville, Pa.
- Granite City Steel Co., Granite City, Ill.
- Wisconsin Steel Co., South Chicago, Ill.
- Columbia Steel Co., San Francisco
- Copperweld Steel Co., Glassport, Pa.
- Alan Wood Steel Co., Conshohocken, Pa.
- Calstrip Steel Corp., Los Angeles
- Allegheny Ludlum Steel Corp., Pittsburgh
- Claymont Steel Corp., Claymont, Del.
- Continental Steel Corp., Kokomo, Ind.
- Rotary Electric Steel Co., Detroit
- Laclede Steel Co., Alton, Ill.
- Northwestern Steel & Wire Co., Sterling, Ill.
- Keystone Steel & Wire Co., Peoria, Ill.
- Central Iron & Steel Co., Harrisburg, Pa.
- Carpenter Steel Co., Reading, Pa.
- Eastern Stainless Steel Corp., Baltimore
- Washington Steel Corp., Washington, Pa.
- Jessop Steel Co., Washington, Pa.
- Blair Strip Steel Co., New Castle, Pa.
- Superior Steel Corp., Carnegie, Pa.
- Timken Steel & Tube Div., Canton, Ohio
- Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- Reeves Steel & Mfg. Co., Dover, Ohio
- John A. Roebling's Sons Co., Trenton, N. J.
- Simonds Saw & Steel Co., Fitchburg, Mass.
- McLouth Steel Corp., Detroit
- Cold Metal Products Co., Youngstown
- Thomas Steel Co., Warren, Ohio
- Wilson Steel & Wire Co., Chicago
- Sweet's Steel Co., Williamsport, Pa.
- Superior Drawn Steel Co., Monaca, Pa.
- Tremont Nail Co., Wareham, Mass.
- Firth Sterling St. & Carbide, McKeesport
- Ingersoll Steel Div., Chicago
- Phoenix Iron & Steel Co., Phoenixville, Pa.
- Fitzsimons Steel Co., Youngstown
- Stanley Works, New Britain, Conn.
- Universal-Cyclops Steel Corp., Bridgeville, Pa.
- American Cladmetals Co., Carnegie, Pa.
- Cuyahoga Steel & Wire Co., Cleveland
- Bethlehem Pacific Coast Steel, San Fran.
- Follansbee Steel Corp., Pittsburgh
- Niles Rolling Mill Co., Niles, Ohio
- Atlantic Steel Co., Atlanta
- Acme Steel Co., Chicago
- Joslyn Mfg. & Supply Co., Chicago
- Detroit Steel Corp., Detroit
- Wycoff Steel Co., Pittsburgh
- Bliss & Laughlin, Inc., Harvey, Ill.
- Columbia Steel & Shafting Co., Pittsburgh
- Cumberland Steel Co., Cumberland, Md.
- La Salle Steel Co., Chicago
- Monarch Steel Co., Inc., Hammond, Ind.
- Empire Steel Co., Mansfield, Ohio
- Mahoning Valley Steel Co., Niles, Ohio
- Oliver Iron & Steel Co., Pittsburgh
- Pittsburgh Screw & Bolt Co., Pittsburgh
- Standard Forging Corp., Chicago
- Driver Harris Co., Harrison, N. J.
- Detroit Tube & Steel Div., Detroit
- Reliance Div., Eaton Mfg. Co., Massillon, Ohio
- Sheffield Steel Corp., Kansas City
- Plymouth Steel Co., Detroit
- Wickwire Spencer Steel, Buffalo
- Angell Nail and Chaplet, Cleveland
- Mid-States Steel & Wire, Crawfordsville, Ind.
- National Supply, Pittsburgh, Pa.
- Wheatland Tube Co., Wheatland, Pa.
- Mercer Tube & Mfg. Co., Sharon, Pa.
- Woodward Iron Co., Woodward, Ala.
- Gloss-Sheffield Steel & Iron Co., Birmingham
- Hanna Furnace Corp., Detroit
- Interlake Iron Corp., Cleveland
- Lone Star Steel Co., Dallas
- Mystic Iron Works, Everett, Mass.
- Jackson Iron & Steel Co., Jackson, O.
- Globe Iron Co., Jackson, O.
- Pittsburgh Coke & Chemical Co., Pittsburgh
- Shenango Furnace Co., Pittsburgh
- Tennessee Products & Chem. Corp., Nashville
- Koppers Co., Inc., Granite City, Ill.
- Page Steel & Wire Div., American Chain & Cable, Monessen, Pa.
- Wallingford Steel Co., Wallingford, Conn.
- Tonawanda Iron Div., N. Tonawanda, N. Y.
- Pilgrim Drawn Steel Div., Automotive Materials Corp., Plymouth, Mich.

Steel Prices

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots reolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slab billets reolling	16.50	20.00	22.00	21.00	32.25	26.25	28.50	18.50	20.00	16.75
Forg. discs die blocks rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets forging	28.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars wires structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets*: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 4¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 45.
Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 4¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13 (type 301 add 1/4¢); Butler, Pa., 7; Wallingford, Conn., 104.
Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.
Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28; Monessen, 103; Syracuse, N. Y., 17; Bridgeville, Pa., 59.
Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44; Syracuse, N. Y., 17.
Plates: Brackenridge, Pa., 28 (type 416 add 1/4¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.
Forged discs, die blocks, rings: Pittsburgh, 17; Syracuse, 17; Ferndale, Mich., 28; Washington, Pa., 39.
Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1; Syracuse, N. Y., 17.

***ALLEGHENY LUDLUM**—Slightly higher on Type 301; slightly lower on others in 300 Series.
WASHINGTON STEEL—Slightly lower on 300 Series except where noted.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9-15 1/2 gal.	Fence Posts	Single Loop Bale Ties	Twisted Barb Wire	Gal. Barbed Wire	Merch. Wire Anvil	Merch. Wire Gal. (1)
Alabama City-4	118	126	123	136	5.70	5.95		
Aliquippa, Pa.-5	118	132	136	140	5.70	6.15		
Atlanta-65	121	133	126	126	143.5	95.6	40	
Bartonville-34	118	130	123	143	143.5	70.8	15	
Buffalo-85					4.85			
Cleveland-86	125							
Cleveland-2					5.70	6.15		
Crawfordsville-57		132			145.5	95.6	40	
Donora, Pa.-2	118	130	123	140	140.5	70.8	15	
Duluth-2	118	130	123	140	140.5	70.8	15	
Fairfield, Ala.-11	118	130	123		140.5	70.8	15	
Houston-83	126	138			148.6	106.55		
Johnstown, Pa.-3	118	130		140	140.5	70.8	15	
Joliet, Ill.-2	118	130	123		140.5	70.8	15	
Kokomo, Ind.-30	120	132	125	138	142.5	80.6	05	
Los Angeles-62					6.65			
Kansas City-83	130		135		152.6	30.6	75	
Minnequa-14	123	138	130	128	146.5	95.6	40	
Monessen-18	124	135			145.5	95.6	40	
Moline, Ill.-4			136					
Pittsburg								
Cal.-24	137			147	156	160.6	65.8	80
Portsmouth-20	124	137			147.6	106.8		
Rankin, Pa.-2	118	130		140	140.5	70.8	15	
So. Chicago, Ill.-4	118	126	140		136.5	70.8	15	
S. San Fran.-14				147	160.6	65.7	10	
Sparrows Pt.-3	120		125	142	142.5	80.6	25	
Sterling, Ill.-33	118	130		123	140	140.5	70.8	15
Struthers, Ohio-6					5.70	6.15		
Torrance, Cal.-24	138				6.65			
Worcester-2	124				6.00	6.45		
Williamsport, Pa.-51			150					

Cut Nails, carloads, base, \$7.35 per 100 lb (less 20¢ to jobbers), at Conahohocken, Pa., (26), Wheeling, W. Va., (15), \$7.15.
 (1) Alabama City and So. Chicago do not include zinc extra.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tin Plates	Track Bolts
Bessemer-1	3.80	4.00	4.70					
Chicago-4				6.15				
Ensley-11	3.60	4.00						
Fairfield-11		4.00	4.40			8.60	4.50	
Gary-1	3.60	4.00				8.60	4.50	
Ind. Harbor-8	3.60	4.70	6.15	5.60	8.60	4.50		
Johnstown-3		4.00		5.60	8.60			
Joliet-1		4.00	4.70					
Kansas City-83				6.40				8.55
Lackawanna-3	3.60	4.00	4.70					
Lebanon-3				6.15		8.60	4.50	
Minnequa-14	3.60	4.50	4.70	6.15		8.60	4.50	8.55
Pittsburgh-77						9.35		8.55
Pittsburgh-78								8.55
Pittsburgh-5				6.15				
Pittsburgh-24							4.55	
Seattle-62				6.65			4.85	
Steelton-3	3.60		4.70				4.50	
Struthers-5				6.15				
Torrance-24							4.55	
Youngstown-4				6.15				

BOILER TUBES \$ Per 100 ft., cut, 10 to 24 ft

F.o.b. Mill	Size	Seamless	Elec. Weld
	OD-In.	B.W. Ga.	H.R. C.D. H.R. C.D.
Babcock & Wilcox	2	13	22.67 26.66 21.99 25.86
	2 1/2	12	30.48 35.84 29.57 34.76
	3	12	33.90 39.90 32.89 38.70
	3 1/2	11	42.37 49.89 41.10 48.39
	4	10	52.60 61.88 51.03 60.02
National Tube	2	13	21.82 26.48
	2 1/2	12	29.65 36.32
	3	12	34.00 41.64
	3 1/2	11	40.34 49.41
	4	10	51.21 62.72
Pittsburgh Steel	2	13	27.00
	2 1/2	12	30.49 37.15
	3	12	34.95 42.59
	3 1/2	11	41.48 50.54
	4	10	52.65 64.16

FLUORSPAR

Washed gravel, f.o.b. Rosclair, Ill.
 Price, net ton; Effective CaF₂ content:
 70% or more.....\$43.00
 60% or less.....40.00

CAST IRON WATER PIPE

Per Net Ton
 6 to 24-in., del'd Chicago, \$105.30 to \$108.80
 6 to 24-in., del'd N. Y. 108.50 to 109.50
 6 to 24-in., Birmingham 91.50 to 96.00
 6-in and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less \$123.00 to \$130.00
 Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD														SEAMLESS								
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2-3 In.		3 1/2-4 In.				
	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.	Blik.	Gal.			
STANDARD T. & C.																							
Sparrows Pt.-3	34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0									
Cleveland-4	36.0	14.0	39.0	18.0	41.5	21.5	42.9	22.0	42.5	23.0	43.0	23.5	43.5	24.0									
Oakland-19	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0									
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	9.0	32.5	11.5	34.5	13.5			
Pittsburgh-10	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5			
Alton, Ill.-32	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0									
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0									
Pittsburgh-88	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5		32.5		34.5				
Wheeling-15	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0									
Wheatland-89	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5									
Youngstown-6	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5			
EXTRA STRONG PLAIN ENDS																							
Sparrows Pt.-3	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0									
Cleveland-4	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0									
Oakland-19	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0									
Pittsburgh-5	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	15.5			
Pittsburgh-10	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5			
Alton, Ill.-32	32.5	12.0	36.5	16.0	38.5	19.5	39.0	20.0	39.5	21.0	40.0	21.5	40.5	22.0									
Sharon-90	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0									
Pittsburgh-88	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0		33.0		36.5				
Wheeling-15	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0									
Wheatland-89	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5									
Youngstown-6	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5			

Miscellaneous Prices

WAREHOUSES

Base price, f.o.b., dollars per 100 lb. (Metropolitan area delivery add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢).

Cities	Sheets			Strip		Plate Shapes		Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard	Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4815	Hot-Rolled A 4140	Cold-Drawn A 4815	Cold-Drawn A 4140
Baltimore	5.60	6.84	7.49 ²	6.04		5.80	6.14	6.04	6.84	10.24	10.54	11.89	12.19
Birmingham*	5.90	6.40	6.75	5.55		5.95	5.70	5.55					
Boston	6.20	7.00	7.74	6.15	8.90 ⁴	6.48	6.20	6.05	6.79	10.25	10.55	11.90	12.20
Buffalo	5.90	6.40	7.74	5.86		6.05	5.80	5.60	6.40	10.15	10.45	11.80	12.10
Chicago	5.60	6.40	7.75	5.55		5.90	5.70	5.55	6.30	9.60	10.10	11.45	11.75
Cincinnati*	5.87	6.44	7.39	5.80		6.19	6.09	5.90	6.61	10.15	10.45	11.80	12.10
Cleveland	5.60	6.40	8.10	5.69	8.90	5.92	5.82	5.57	6.40	9.91	10.21	11.56	11.86
Detroit	5.78	6.53	7.09	5.94		5.99	6.09	5.84	6.56	10.11	10.41	11.76	12.06
Houston	7.00	8.25				6.65	6.50	6.65	9.35	10.35	11.25		12.75
Indianapolis, del'd	6.00	6.90	8.15	5.95		6.20	6.10	5.95	6.80				
Kansas City	6.00	6.90	7.45	6.15	7.80	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35
Los Angeles	6.35	7.90	8.85	6.40	9.45 ⁶	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50
Memphis*	6.33	7.00		6.33		6.43	6.33	6.06	7.16				
Milwaukee	5.74	6.54	7.99	5.69		5.94	5.84	5.69	6.44	9.94	10.24	11.59	11.89
New Orleans*	5.70	6.59		5.75	7.25	5.95	5.75	5.75	7.30				
New York*	5.67	7.10 ³	8.14 ²	6.29	6.63 ⁴	6.28	6.10	6.12	6.99	10.05	10.35	11.70	12.10
Norfolk	6.50 ³			6.89		6.58				10.15	10.45	11.80	12.20
Philadelphia*	5.90	6.80	8.00	6.10		6.05	5.90	6.05	6.86	9.90	10.20		
Pittsburgh	5.60	6.40	7.75	5.65		5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75
Portland	6.80	8.95	8.80	5.95		6.80	6.95	6.80			12.15		
Salt Lake City	7.95		9.10	7.30		8.05	6.75	7.95	9.00				
San Francisco*	6.85	8.05 ²	8.75	6.80	9.95 ⁴	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.50
Seattle	7.05	8.60	9.20	9.05		6.75	6.65	6.75	9.05				
St. Louis	5.80	6.65	8.00	5.80	6.00 ⁴	6.13	6.03	5.80	6.55	10.05	10.35	11.70	12.00
St. Paul*	6.16	6.96	8.31	6.11		6.36	6.26	6.11	6.96	10.36	10.66	12.01	12.31

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity. EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 5999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50			
Birmingham-4	48.38	48.88					
Birmingham-91	48.38	48.88					
Birmingham-92	48.38	48.88					
Buffalo-4	52.00	52.50	53.00				
Buffalo-93	52.00	52.50	53.00			63.75	
Chicago-94	52.00	52.50	52.50	53.00			
Cleveland-4	52.00	52.50	52.50	53.00	57.00		
Dalingerfield, Tex.-95	48.00	48.50	48.50				
Duluth-94	52.00	52.50	52.50	53.00			
Erie-94	52.00	52.50	52.50	53.00			
Everett, Mass.-96	52.00	55.25	55.75				
Fontana-19	58.00	58.50					
Geneva, Utah-16	52.00	52.50	52.50	53.00			
Granite City, Ill.-102	53.90	54.40	54.90				
Hubbard, Ohio-6	52.00	52.50	52.50				
Ironton, Utah-16	52.00	52.50					
Jackson, Ohio-97, 98						62.50	
Lyle, Tenn.-101							66.00
Monessen-18	54.00						
Neville Island-99	52.00	52.50	52.50	53.00			
Pittsburgh-1	52.00			53.00			
Sharpsville-100	52.00	52.50	52.50	53.00			
Steeltown-3	54.00	54.80	55.00	55.50	50.00		
Swedeland-26	56.00	56.50	57.00	57.50			
Toledo-94	52.00	52.50	52.50	53.00			
Troy, N. Y.-4	54.00	54.50	55.00		60.00		
Youngstown-6	52.00	52.50	52.50	53.00			
N. Tawawana, N. Y.-105		52.50	53.00				

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phos. 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 28¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add \$1.50 per ton for each 0.50 pct silicon over base (6.01 to 8.50 pct) up to 17 pct. \$1 per ton for 6.75 pct or more phosphorus, manganese as above. Bessemer furnace prices are \$1 over comparable silvery iron.

REFRACTORIES

Fire Clay Brick

(F.o.b. works)
Carloads, Per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5).....\$94.60
No. 1 Ohio.....88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.....88.00
No. 2 Ohio.....79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50).....13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.....\$94.60
Childs, Pa.....99.00
Hays, Pa.....100.10
Chicago District.....104.50
Western Utah and Calif.....111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago.....111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.).....16.50
Silica cement, net ton, bulk, Hays, Pa.....13.70
Silica cement, net ton, bulk, Ensley, Ala.....17.60
Silica cement, net ton, bulk, Chicago District.....17.60
Silica cement, net ton, bulk, Utah and Calif.....24.70

Chrome Brick

Per Net Ton

Standard chemically bonded, Balt., Chester.....\$82.00

Magnesite Brick

Standard, Baltimore.....\$104.00
Chemically bonded, Baltimore.....93.00

Grain Magnesite

St. %-in. grains

Domestic, f.o.b. Baltimore, in bulk fines removed.....\$62.70
Domestic, f.o.b. Chewelah, Wash., in bulk.....36.30
in sacks.....41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢.....\$13.00

COKE

Furnace, beehive (f.o.b. oven) Net Ton
Connellsville, Pa.\$14.50 to \$15.00
Foundry, beehive (f.o.b. oven)
Connellsville, Pa.\$17.50 to \$18.00
Foundry, oven coke
Buffalo, del'd\$26.69
Chicago, f.o.b.23.00
Detroit, f.o.b.24.00
New England, del'd.....24.80
Seaboard, N. J., f.o.b.....22.75
Philadelphia, f.o.b.22.70
Swedeland, Pa., f.o.b.22.60
Painesville, Ohio, f.o.b.....24.00
Eric, Pa., f.o.b.....23.50
Cleveland, del'd25.72
Cincinnati, del'd25.06
St. Paul, f.o.b.....22.50
St. Louis25.40
Birmingham, del'd21.69
Neville Island23.00

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports) Per gross ton

Old range, bessemer.....\$8.70
Old range, nonbessemer.....8.55
Mesabi, bessemer.....8.45
Mesabi, nonbessemer.....8.30
High phosphorus.....8.30
After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

C-R SPRING STEEL

F.o.b. Mill Cents Per Lb.	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn.-58	5.35	6.80	7.40	9.35	11.05
Carnegie, Pa.-41		6.80	7.40	9.35	11.05
Cleveland-2	4.85	6.45	7.40	9.35	11.05
Detroit-68	5.60	6.65	7.25		
New Castle, Pa.-40	5.35	6.80	7.40	9.35	
New Haven, Conn.-59	5.85	6.75	7.35		
Sharon, Pa.-13	5.35	6.80	7.40	9.35	11.05
Wairton, W. Va.-9	5.35	6.80	7.40	9.35	11.05
Worcester, Mass.-2	4.95	6.75	7.70	9.65	11.05
Youngstown-48		6.80	7.40	9.35	11.05

Miscellaneous Prices

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices
(Base discount, f.o.b. mill, Pittsburgh,
Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pot Off List	
	Less Case	C.
1/2 in. & smaller x 6 in. & shorter	15	28 1/2
9/16 in. & 5/8 in. x 6 in. & shorter	18 1/2	30 1/2
3/4 in. & larger x 6 in. & shorter	17 1/2	29 1/2
All diam. longer than 6 in.	14	27 1/2
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

Nuts, Hot Pressed, Cold Punched—Sq

	Pot Off List	
	Less Keg (Reg.)	Less Keg (Hvy.)
1/2 in. & smaller	15	28 1/2
9/16 in. & 5/8 in.	12	25
3/4 in. to 1 1/2 in.	9	23
Inclusive	9	23
1 1/2 in. & larger	7 1/2	22

Nuts, Hot Pressed—Hexagon

1/2 in. & smaller	26	37
9/16 in. & 5/8 in.	16 1/2	29 1/2
3/4 in. to 1 1/2 in.	12	25
Inclusive	12	25
1 1/2 in. & larger	8 1/2	23

Nuts, Cold Punched—Hexagon

1/2 in. & smaller	26	37
9/16 in. & 5/8 in.	23	35
3/4 in. to 1 1/2 in.	19 1/2	31 1/2
Inclusive	19 1/2	31 1/2
1 1/2 in. & larger	12	25

Nuts, Semi-Finished—Hexagon

	Reg.	Hvy.
1/2 in. & smaller	35	45
9/16 in. & 5/8 in.	29 1/2	40 1/2
3/4 in. to 1 1/2 in.	24	36
Inclusive	24	36
1 1/2 in. & larger	13	26

Stove Bolts

	Pot Off List
Packaged, steel, plain finished	48—10
Packaged, plated finish	31—10
Bulk, plain finish**	62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.
**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

	Base per 100 lb.
1/2 in. & larger	\$7.85
7/16 in. & smaller	36
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	

Cap and Set Screws

	Pot Off List
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 5/8 in. x 6 in., SAE 1020, bright	54
1/4 in. thru 1 in. up to & including 6 in.	48
1/4 in. thru 5/8 in. x 6 in. & shorter high C double heat treat	46
1/4 in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. & shorter	53

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

ELECTRODES

Cents per lb., f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
GRAPHITE		
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2 1/2	24, 30	23.15
2	24, 30	25.36
CARBON		
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b. mill	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. (21)...	\$29.5	
Washgtn, Pa. (39)...	\$29.5	
Claymont, Del. (29)...	\$28.00	
Conshohocken, Pa. (26)		\$27.50
New Castle, Ind. (55)...	\$26.50	\$25.50
Nickel-carbon		
10 pct Coatesville (21)...	\$32.5	
Inconel-carbon		
10 pct Coatesville (21)...	\$40.5	
Monel-carbon		
10 pct Coatesville (21)...	\$33.5	
No. 302 Stainless-copper		
stainless, Carnegie, Pa. (60)		\$77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)...		\$7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill	Base per lb
W Cr V Mo Co	
18 4 1 — —	\$15.05
18 4 1 — —	\$2.13
18 4 2 — —	\$1.65
1.5 4 1.5 8 —	\$81.0
6 4 2 6 —	\$6.5¢
High-carbon chromium	\$3.5¢
Oil hardened manganese	\$5¢
Special carbon	\$2.5¢
Extra carbon	\$7¢
Regular carbon	\$3¢
Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.	

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.	
Swedish sponge iron c.l.f.	
New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, In East	10.00¢
Domestic sponge iron, 98+%	
Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+%	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+%	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+%	\$3.0¢ to \$14.8
Aluminum	\$1.5¢
Brass, 10 ton lots	\$30.00¢ to \$32.25¢
Copper, electrolytic, 10.75¢ plus metal value	
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb.	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd.	\$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	\$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met value
Stainless steel, 302	\$3.00¢
Stainless steel, 316	\$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	\$6.00
Zinc, 10 ton lots	\$3.0¢ to \$3.5¢

ELECTRICAL SHEETS

22 Ga. H-R out length

F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 88	Transf. 96
Beech-Bottom-15	7.25	8.50	9.30	9.85	10.40	11.10	
Brackenridge-28	7.25	8.50	9.30	9.85	10.40	11.10	
Follansbee-63	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Granite City-22	7.95	9.20					
Ind. Harbor-3	6.75	7.25					
Mansfield-75	7.25	7.75	9.00	9.80			
Niles, O.-64	7.05	7.55					
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O.-4	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.10

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered, (65-72% Cr, 2% max. Si.)	
0.06% C	30.50
0.10% C	30.00
0.15% C	29.75
2.00% C	
65-69% Cr, 4-9% C	28.75
62-66% Cr, 4-6% C, 6-9% Si	22.00

Foundry Ferrochrome

Contract prices, cents per lb of alloy. Noncontract prices add 2.50¢ per lb. High carbon 8 Mesh and down.	
62 to 66% Cr, 5 to 7% C, 7 to 10% Si.	
Carloads, bulk	23.25
Carloads, packed	24.15
Ton lots, packed	27.25

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.	
--	--

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.	
0.10% max. C	\$1.14
0.50% max. C	1.10
9 to 11% C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si. Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.	
--	--

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.	
30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	20.60
Ton lots	22.30
Less ton lots	23.80

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	18.50¢
Less ton lots	17.75¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. SI 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	18.00¢
Ton lots to carload packed	19.00¢
Less ton lots	20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, 1/2 in. x 12 mesh.	
Ton lots	17.50
Less ton lots	19.50

Ferroalloy Prices

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.
 F.o.b. Niagara Falls, Alloy, W. Va., \$185
 Ashtabula, O. \$187
 F.o.b. Johnstown, Pa. \$185
 F.o.b. Sheridan, Pa. \$188
 F.o.b. Etna, Clairton, Pa. \$188
 \$2.00 for each 1% above 82% Mn.
 penalty, \$2.15 for each 1% below 78%
 Briquets—Cents per pound of briquet,
 delivered, 66% contained Mn. 10.95
 Carload, bulk 12.55
 Ton lots 12.55

Spiegeleisen

Contract prices gross ton, lump, f.o.b.
 16-19% Mn 19-21% Mn
 3% max. Si 3% max. Si
 Palmerton, Pa. \$74.00 \$75.00
 Pgh. or Chicago 75.00 76.00

Manganese Metal

Contract basis, 2 in. x down, cents per
 pound of metal, delivered.
 86% min. Mn, 0.2% max. C, 1% max.
 Si, 2.5% max. Fe. 34.75
 Carload, packed 36.25
 Ton lots 36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed
 east of Mississippi, cents per pound. 28
 Carloads 30
 Ton lots 32
 Less ton lots 32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract
 price, carloads, lump, bulk, delivered, per
 lb. of contained Mn 19.15¢

Calcium Metal

Eastern zone contract prices, cents per
 pound of metal, delivered.
 Cast Turnings Distilled
 Ton lots \$2.05 \$2.95 \$3.75
 Less ton lots 2.40 3.30 4.55

Silicomanganese

Contract basis, lump size, cents per
 pound of metal, delivered, 65-68% Mn,
 18-20% Si, 1.5% max. C. For 2% max. C,
 deduct 0.2¢.
 Carload bulk 9.90
 Ton lots 11.55
 Briquet, contract basis carlots, bulk
 delivered, per lb of briquet 11.15
 Ton lots 12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk,
 Iowa, or Wenatchee, Wash., \$92.50 gross
 ton, freight allowed to normal trade area.
 Si 15.01 to 15.50 pct, f.o.b. Niagara Falls,
 N. Y., \$90.00. Add \$1.00 per ton for each
 additional 0.50% Si up to and including
 18%. Add \$1.00 for each 0.50% Mn over
 1%.

Silicon Metal

Contract price, cents per pound con-
 tained Si, lump size, delivered, for ton lots
 packed.
 96% Si, 2% Fe. 21.70
 97% Si, 1% Fe. 22.10

Silicon Briquets

Contract price, cents per pound of
 briquet bulk, delivered, 40% Si, 2 lb Si
 briquets.
 Carload, bulk 6.95
 Ton lots 8.55

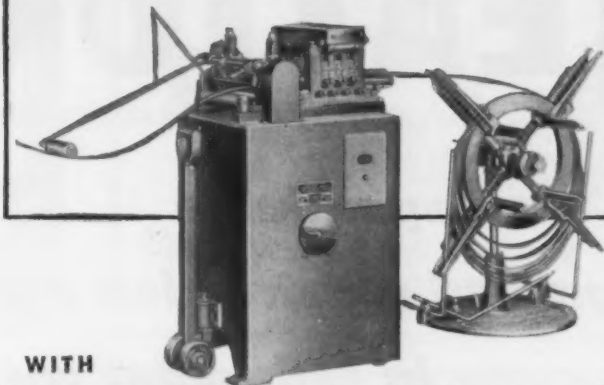
Electric Ferrosilicon

Contract price, cents per pound con-
 tained Si, lump, bulk, carloads, delivered.
 45% Si 20.00 75% Si 14.30
 10% Si 12.40 85% Si 15.55
 0-95% Si 17.50

Low-Carbon Ferromanganese

Contract price, cents per pound Mn con-
 tained, lump size, del'd, Mn 85-90%.
 Carloads Ton Less
 0.7% max. C, 0.06% 26.25 28.10 29.30
 P, 90% Mn. 26.25 27.60 28.80
 0.07% max. C. 26.25 27.10 28.30
 0.15% max. C. 24.75 26.60 27.80
 0.30% max. C. 24.25 26.10 27.30
 0.50% max. C. 21.25 23.10 24.30
 0.75% max. C. 21.25 23.10 24.30
 7.60% max. Si. 21.25 23.10 24.30

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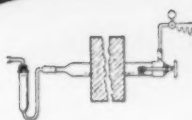
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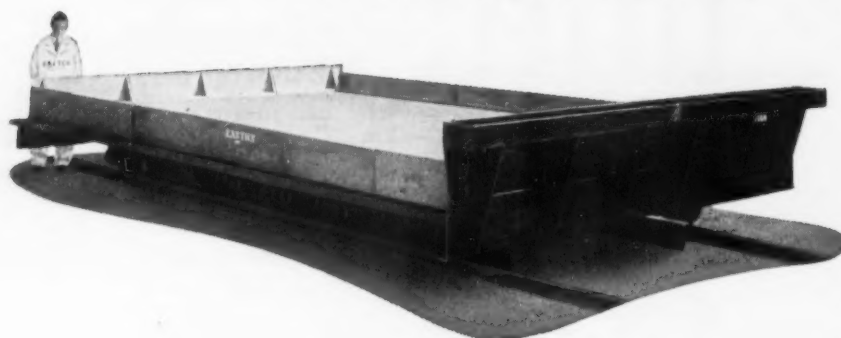
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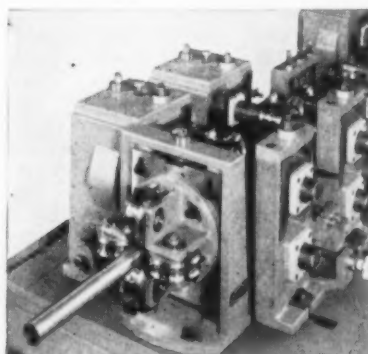
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Ferroalloy Prices

Alsiifer, 20%, Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	9.30
Ton lots	11.30
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.15
Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.	
Ton lots	\$4.30
Less ton lots	4.35
Ferro-Tantalum - columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	\$3.75
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.33
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$66.00
10 tons to less carload	76.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa. freight allowed, ton lots, per lb contained Ti	\$1.35
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.50
Less ton lots	1.45
Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	\$177.00
Ferrotungsten, standard, lump or 1/4 x down, packed, per pound contained W, 5 ton lots, delivered	\$5.00
Ferrovandium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primus) 3.20-3.25	
Molybdenic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	\$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.15
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.50
Ton lots, bulk lump	15.75
Less ton lots, lump	16.25
Vanadium pentoxide, 35-39% V ₂ O ₅ contract basis, per pound contained V ₂ O ₅	\$1.35
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	7.00
Boron Agents	
Contract prices per lb of alloy, del.	
Borosil, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B	\$5.35
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45
Less ton lots, per pound	50
Carbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00
Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	\$1.20
F.o.b. Wash., Pa.; 100 lb up	
10 to 14% B	.35
14 to 18% B	1.20
19% min. B	1.30
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	\$1.00
No. 6	60
No. 79	50
Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd	\$1.40
Ton lots	1.57
Less ton lots	
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	\$1.00
Less ton lots	
Silicaz, contract basis, delivered.	
Ton lots	45.00



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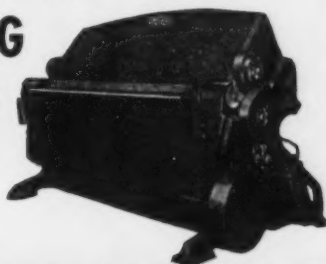
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Scrap iron and steel supplies are again running short of the amounts needed to maintain the present high level of steel production.

You're asked to search out the idle iron and steel in your plant and yard . . . and turn it over to your local scrap dealer.

Be sure to include obsolete machinery, un-used jigs and fixtures, gears, pulleys, chains, pipe and other equipment . . . non-ferrous scrap is needed now, too!



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2873 cu. ft. Worthington 29" x 21" & 18 1/2" x 21". Complete with Elec. Equipment
1480 cu. ft. Worthington 23" x 14" x 16". With 300 H.P. Syn Motor 4160/3/60

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Hughes Keenan Roustabout Crane Model MC-4 25' Gooseneck Boom, Mounted on Tractor. Equipped with pneumatic tires

CRANE—LOCOMOTIVE

Industrial Brownhoist Type B Steam Locomotive Crane, 50' Boom. New Boiler Installed 1946

CRANE TROLLEY

40 Ton Shaw-Box Trolley, Equipped with 15 H.P. G.E. Motor. Gauge of Trolley 7'6", Lift 80'. New 1942

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No. 3 Blue Valley Flanging Machine. Will flange flat heads from 48" to 10' or 12' dia. Silent chain drive with A.C. Motor. Equipped with air cylinder and hydraulic pump

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2" AJAX Upsetting and Forging Machine—New 1941. Equipped with Air Clutch

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400 lb. Moore Type "UT" Melting Furnace Top Charge, Complete with Transformer. New 1943—Little Used

15 ton Heroult Model V-12 Electric Melting Furnace, Top Charge hydraulically operated, Complete with Transformer Equipment

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No. 72 Hanchett Vertical Surface Grinder Three Spindle 72" Rotary Table with Electrical Equipment

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No. 6 Giant Vertical Keyseater Complete with Electrical Equipment

LATHE—TURRET

Gisholt Model 2L Turret Lathe, Motor Driven 15" Dia. 3 Jaw Universal Chuck, 4" Hole in Spindle. NEW 1942 or Later.

MOTOR

750 H.P. G.E. Synchronous Motor 2300/3/60 450 RPM Slightly Used

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48 x 48" x 18' Cincinnati, Four Head
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60 x 60" x 18' Delrick & Harvey Three Head

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1000 Ton United Steam Hydraulic Forging Press Quick Acting, Stroke (Daylight) 4". Distance Between Columns 31", Rtd. 72" Intensifier and Accumulator Included, also 8000 lb. Alliance Straight Line Manipulator. NEW 1942

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18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.
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300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine

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700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide
40 KVA Sciaky Spot Welder, 36" Throat 440/3/60 operation

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The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

OPS Meeting—An MDNA group is meeting this week, Sept. 26 and 27, with OPS officials in an attempt to work out a pricing formula for used machine tools. The time is ripe, for new machine tool builders have pretty well settled their pricing problems. But the used market still aches from galloping inflation.

Used machine tool prices may be rolled back to percentages of January new machine levels. An extra percentage may be tacked on to compensate for inflation since that time. New guess as to when the order will be issued is Oct. 15.

Waiting for Order—Several dealers have told THE IRON AGE that they know where some idle late type machines can be found. All that is needed to loosen up this equipment is a concrete pricing order. Inflation has hurt the used machinery field so grievously that no one seriously sympathizes with the idea that high prices are needed to bring out the machines.

One New York dealer reports that, while his local business remains spotty, he has made a few out-of-town deals with subcontractors. These are from distant, widely-scattered points.

Protect Market—Government loan of stored machine tools from depots at Marietta, Ga., and Omaha, Neb., is speeding up. Rebuilding and reconditioning is necessary to many of them.

Nothing can be done now to channel these tools into the used market—their rightful place. The tools are needed too desperately for used dealers to dream of making a fuss. But something should be done for the future protection of the used market.

When this emergency is over, the government should release the machines now being built for defense work into the used market through some system such as War Assets Administration. The ma-

chines will not be lost, will be in use or in warehouses.

Stumbling Block—A Pittsburgh crane broker is learning that it's one thing to find desirable equipment, another to get it onto the market. His recent experience in this connection pointed up a stumbling block to turning now idle equipment to a production role in another plant.

The stumbling block is this: Oftentimes in a busy plant the monetary gain that might be realized from sale of idle machinery is more than offset by the loss of production while the equipment is being removed from the plant.

All or None—For example, the Pittsburgh broker recently found five cranes—10-to-15-tonners—in an eastern plant. He offered to buy several cranes, but the answer was a firm "No." The cranes were not for sale individually, but together.

In short, the owner was willing to go along with perhaps a week-end production interference while all the cranes were being dismantled, but he was not willing to put up with a one-now, one-later proposition.

The broker, not being in a position to store such equipment, passed up the opportunity.

Dismantling Costs—Another problem in the movement of cranes is the high cost of dismantling. The charges for this, according to one broker, are too close to the selling price for comfort.

Small cranes—1, 2, and 3-ton jobs—are becoming more plentiful.

Demand for all types of equipment continues strong in the Pittsburgh area. Defense plants are not a major factor in this as yet. Defense contractors in the market for machine tools are asking for 3 or 4-year-old equipment, almost impossible to find.

A CHILTON

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Bearing research and
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Nothing Rolls Like a Ball...
**NEW DEPARTURE
BALL BEARINGS**

The advertisement features a central globe showing the Americas, surrounded by six ball bearings. Thin lines connect the bearings to the globe, forming a star-like pattern. Each bearing has 'NEW DEPARTURE' and 'MADE IN U.S.A.' inscribed on its outer ring. The background is dark, making the globe and bearings stand out.

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

153FC



Improve Cupola Charging!

Make your present charging system more efficient at little or no extra cost! Our new booklet, "Tips On Improving Cupola Charging," contains valuable information on obtaining a smoother flow of materials from freight cars to cupola. It tells how mechanical charging can improve operation and conserve manpower—how to get better unloading and make-up—how improved charging benefits melting—plus many other facts that lead to lower costs and increased output.

Ask your Whiting salesman for your free copy of this new booklet or write . . . specify Bulletin FO-2.

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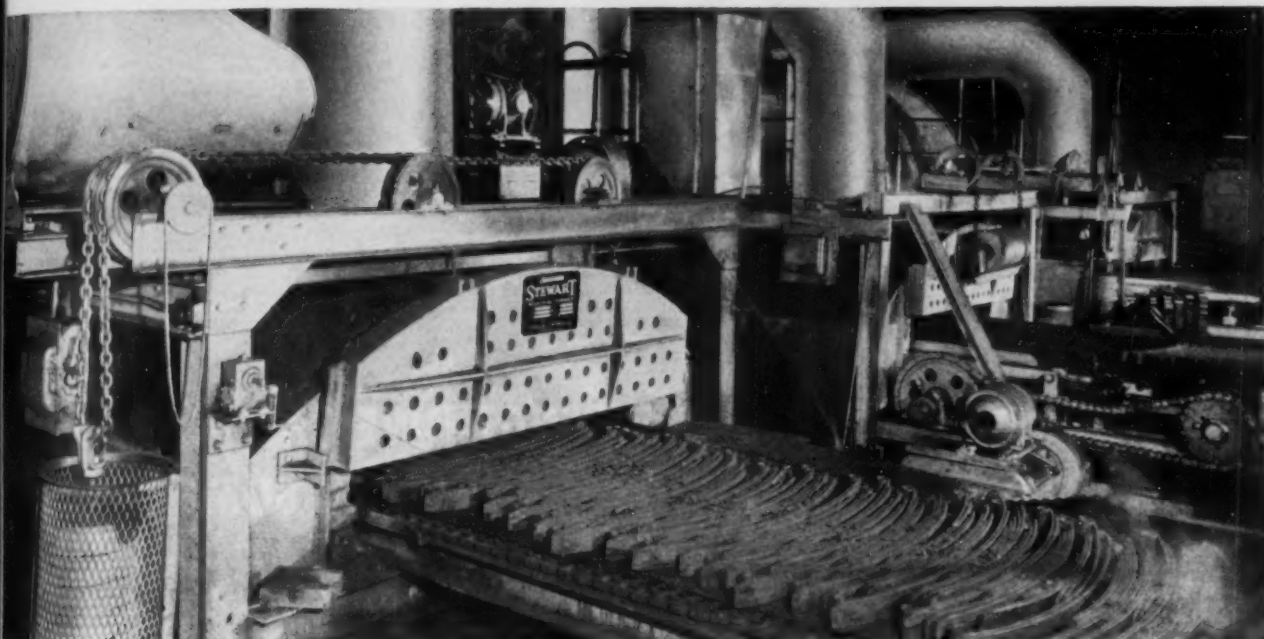
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HEAT TREATING LEAF SPRINGS.

The manufacturing of leaf springs requires a precision mass production heat treatment seldom equalled in any other industrial process. Springs under normal conditions have always been known as a highly stressed part in practically all applications. A finished spring must possess very definite physical properties in order for it to stand up under the heavy loads it must carry and to withstand the fatigue of millions of deflections. In military equipment, they are subjected to even greater loads and abuses. Therefore, to meet ordnance requirements it is of great importance to obtain the maximum physical properties required to meet the spring specifications.



Side view of the recently installed Sunbeam Stewart Air Recirculating Draw Furnace. Outstanding feature of this unit is the hot air-circulating capacity and fan power provided.

Standard Steel Spring of Gary, Indiana, has been using three Sunbeam Stewart Harden Quench and Draw units, only recently adding a new recirculating Draw Furnace, for heat treating their leaf springs. The re-heat or hardening furnaces are of the continuous type, employing five parallel drag-chains running the entire length of the heating chamber. The draw furnaces are of the forced convection type. Each unit has two separate combustion chambers with its own high volume, high temperature recirculating fans.

IF YOU ARE CONSIDERING DEFENSE WORK CALL SUNBEAM STEWART. Designs are available for heat treating the following material:

SHELLS: 57MM; 75MM; 90MM; 105MM; 120MM; 155MM;
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CARTRIDGE CASES (Anneal, Stress Relieve).

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MACHINE GUN CLIPS (Harden, Quench and Draw).

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A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.

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SHARON*

STAINLESS STRENGTH-WEIGHT RATIO IDEAL FOR HEAVY DUTY BOMB RELEASE

Delivering bombs calls for more than just the airplane. The bombs must be hooked in the bomb bay to stay fixed, yet absorb a minimum of shock, regardless of rough flying. And they must be rigged to allow split-second release for pin-point bombing at high speeds. That's where the modern bomb release comes in. The bomb release is constructed of stainless steel because it must

be light, yet have the strength to safely cradle a 2,000 pound bomb. Too, as a precision instrument it must withstand rust and corrosion, another reason designers insist on stainless steel. The manufacture of this and similar all-weather military products demands great amounts of stainless — much of it is being supplied by Sharon Steel Corp.

*Specialists in STAINLESS, ALLOY, COLD ROLLED and COATED Strip Steels.

SHARON STEEL CORPORATION

Sharon, Pennsylvania

DISTRICT SALES OFFICES: CHICAGO, ILL., CINCINNATI, O., CLEVELAND, O., DAYTON, O., DETROIT, MICH., INDIANAPOLIS, IND., MILWAUKEE, WIS., NEW YORK, N. Y., PHILADELPHIA, PENNA., ROCHESTER, N. Y., LOS ANGELES, CALIF., SAN FRANCISCO, CALIF., MONTREAL, QUE., TORONTO, ONT.

For information on Titanium Developments contact Mallory-Sharon Titanium Corp., Indianapolis 6

SHARONSTEEL

Conventions & Meetings

Sept. 28-29—Marking Device Assn., national convention, Edgewater Beach Hotel, Chicago. Association headquarters are at 134 N. LaSalle St., Chicago.

Oct. 1-2—American Machine Tool Distributors Assn., annual meeting, Hadson Hall, Atlantic City, N. J. Association headquarters are at 505 Arch St., Philadelphia.

Oct. 1-4—Assn. of Iron & Steel Engineers, annual convention, Sherman Hotel, Chicago. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 1-4—Society of Industrial Packaging & Materials Handling Engineers, annual Industrial Packaging and Materials Handling Show, Cleveland Public Auditorium, Cleveland. Society headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 3-6—Pressed Metal Institute, annual meeting, Hotel Drake, Chicago. Institute headquarters are at 13210 Shaker Square, Cleveland.

Oct. 5-7—Society of Industrial Designers, annual convention, Moraine Hotel, Highland Park, Ill. Society headquarters are at 48 E. 49th St., New York.

Oct. 8-13—Concrete Reinforcing Steel Institute, semi-annual meeting, Grove Park Inn, Asheville, N. C. Institute headquarters are at 38 S. Dearborn St., Chicago.

Oct. 9-12—Electrochemical Society, national convention, Hotel Statler, Detroit. Society headquarters are at 235 W. 102nd St., New York.

Oct. 10-12—Porcelain Enamel Institute, annual forum, Ohio State University, Columbus. Institute headquarters are at 1010 Vermont Ave., Washington.

Oct. 12-14—Metal Treating Institute, annual meeting, Hotel Detroit-Leland, Detroit. Institute headquarters are at 271 North Ave., New Rochelle, N. Y.

Oct. 14-19—World Metallurgical Congress, Detroit. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

Oct. 15-17—American Institute of Mining & Metallurgical Engineers, Institute of Metals Div., fall meeting, Detroit-Leland Hotel, Detroit. Institute headquarters are at 29 W. 39th St., New York.

Oct. 15-19—American Gas Assn., annual convention, St. Louis. Association headquarters are at 420 Lexington Ave., New York.

Oct. 15-19—National Metal Congress & Exposition, Detroit. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

Oct. 18-20—Anti-Friction Bearing Manufacturers Assn., fall meeting, The Homestead, Hot Springs, Va. Association headquarters are at 60 E. 42nd St., New York.

Oct. 20-23—Steel Boiler Institute, fall meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters are at 1207 Land Title Bldg., Philadelphia.

Oct. 21-25—American Institute of Steel Construction, annual convention, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at 101 Park Ave., New York.

Oct. 22-24—American Mining Congress, metal mining convention, Biltmore Hotel, Los Angeles. Association headquarters are in the Ring Bldg., Washington.

Oct. 22-24—American Standards Assn., national standardization conference and annual meeting, Waldorf-Astoria Hotel, New York. Association headquarters are at 70 E. 45th St., New York.

SPECIAL MACHINES A PROBLEM?

BUILD YOUR OWN

with Bellows

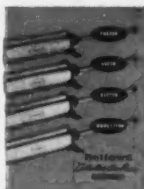
"Packaged" Pneumatic Units

Delivery of special purpose machine tools stretches far into the months. But, often, you can combine a little tool room ingenuity with Bellows "Controlled-Air-Power" Devices and build in your own plant special machines that will break production bottlenecks wide open.

Take the machining operations pictured here. All were runs long enough to warrant special tools and tooling. Yet all are being mass produced by inexpensive tool-room-built special machines, made from standard machine tool components readily available. Machining operations are fed and controlled by Bellows "packaged" pneumatic work or tool feeding devices, synchronized with one another, electrically controlled. In most cases a single unskilled operator is producing automatically two to three times the production formerly obtained.

If you have a manufacturing operation where a special machine would double or triple production it will pay you to get in touch with your local Bellows Field Engineer—a man skilled in solving special production problems. He is listed in your phone directory under "The Bellows Co."

May We Send You
This Interesting Booklet?



Case history stories, diagrams, photo, production details, etc., showing how Bellows "Controlled-Air-Power" Devices can help you obtain more production at lower cost. No obligation. Write: The Bellows Co., Dept. IA 951, Akron 9, Ohio. Ask for Bulletin CL-30.

The BELLOWS Co.

AKRON 9, OHIO

Doubled Production



Milling

Production Increase 500%



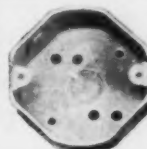
Lathe
Turning

Production Increase 400%



Stamping

12,800 Holes Per Hour



Tapping

Production Increase 700%



Drilling

300% Production Gain



Counter
Boring

From 125 to 650



Drilling
and
Tapping

Doubles Production

Bead
Rolling



60% Faster



Pin Point
Riveting

DESIGNED AND MANUFACTURED BY THE WORLD'S

A.O. Smith

RECTIFIER TYPE, NEMA-RATED

**D-C
WELDER**

**A NEW HEAVY-DUTY WELDER
FOR ALL D-C APPLICATIONS**

★ Field-Proven **SUPERIORITY** ★ Typical
SMITHway Heavy-duty Precision Con-
struction ★ Reduces D-C Welding Costs

Here is A. O. Smith's answer to your D-C welding requirements, a welder that's more efficient than motor-generator sets of like amperage... and much less expensive to buy and maintain.

A. O. Smith has retained in the D-C welder all the winning features that have made the A. O. Smith Hevi-Duty A-C Welders the heavyweight champs of all welders.

These superior features are your assurance of maximum duty-cycle percentage and minimum maintenance—of long-lived performance, unmatched by any other D-C welder:

NEW!

1. High velocity, directed downdraft ventilation and cooling prevents possibility of rectifier stacks overheating, assures proper cooling and internal cleanliness, whether used in shop or out.

NEW!

2. Case-diameter fan and "wind-tunnel" design makes sure of adequate, efficient air flow over all energized parts.

NEW!

3. Ball-bearing jacks—effortless to manipulate—raise and lower primary coils.

NEW!

4. Precision layer-wound coils assure full NEMA-rated capacity plus cooler, long-term operation.

NEW!

5. Simplified design assures maximum dependability, ease of connecting and operating.

NEW!

6. Weather-proof Case at no extra cost permits outdoor or in-shop operation.

Put this new A. O. Smith D-C welder on the job wherever direct-current output is required—and

NEW!



The new A. O. Smith Rectifier-type D-C Welder.
Available in 200, 300 and 400 Amperes.

save money all down the line. No other D-C welder can match it!

Our nearest distributor, listed on the opposite page, is ready to demonstrate the new D-C welder or any other A. O. Smith welding machine.

It will pay you to inquire of him—or to write direct for descriptive literature. Address:

A. O. Smith Corporation
Welding Products Division, Dept. IA-951
Milwaukee 1, Wisconsin

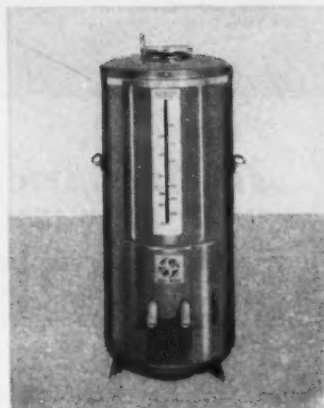
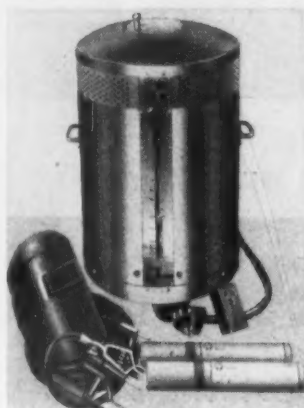
A.O. Smith

WELDING PRODUCTS

Made by Welders . . . for Welders



LARGEST USER OF WELDING AS A PRODUCTION TOOL



A.O. Smith

HEAVY-DUTY, GENERAL PURPOSE AND UTILITY

A-C WELDERS

A COMPLETE LINE OF NEMA-RATED A-C WELDERS

These welding machines were designed originally to meet the needs of A. O. Smith's own welding requirements—the requirements of the world's largest user of welding as a production tool! Commercial expediencies were not in the picture!

As a result A. O. Smith Welders exceed NEMA requirements and excel in performance, length of operating life and overall economy.

Your best choice in welders is an A. O. Smith welder.

Heavy-Duty A-C Welder (top) available in 300, 400 and 500 Amps. models, all with 75 volts open circuit.

General Purpose A-C Welder (left) available in 150, 200 and 250 Amps. models, all with 56 to 80 volts open circuit.

Standard A-C Welder (right) in 400 Amps. model with 75 volts open circuit . . . for all purpose use in any shop.

Not shown—Utility A-C Welder has a range of 25 to 180 Amps. with 53 to 65 volts open circuit.



A.O. Smith

WELDING PRODUCTS

Made by Welders . . . for Welders

Ask the A. O. Smith Welder Distributor Near You for a Demonstration

Pacific Metals Co.
Los Angeles, California

Pacific Metals Co.
San Diego, California

Pacific Metals Co.
San Francisco, California

Western Oxygen Co.
Denver, Colorado

Dixie Gases, Inc.
Atlanta, Georgia

U. S. Steel Supply Co.
Chicago, Illinois

Universal Welding Supply Co.
Chicago, Illinois

H. R. McGarvey
Pekin, Illinois

Mineweld Co. of Indiana
Indianapolis, Indiana

Acme Welding Supply Co.
Louisville, Kentucky

U. S. Steel Supply Co.
Baltimore, Maryland

U. S. Steel Supply Co.
Allston, Massachusetts

LaSalle Electric & Mill Supply Co.
Detroit, Michigan

Welding Gas & Supply Co.
Grand Rapids, Michigan

Jackson Welding Supply Co.
Jackson, Michigan

Wolverine Gas Products
Saginaw, Michigan

U. S. Steel Supply Co.
St. Paul, Minnesota

U. S. Steel Supply Co.
St. Louis, Missouri

U. S. Steel Supply Co.
Newark, New Jersey

Dixie Gases, Inc.
Charlotte, North Carolina

Queen City Supply Co.
Cincinnati, Ohio

Welding & Cutting Supply Co.
Cleveland, Ohio

Ross-Willoughby Co.
Columbus, Ohio

El Paso Welding Supply Co.
El Paso, Texas

Dye Welding Supply Co.
Houston, Texas

Pacific Metals Co.
Salt Lake City, Utah

McJunkin Supply Co.
Charleston, West Virginia

Holt Electric Motor Company
Milwaukee, Wisconsin

U. S. Steel Supply Co.
Milwaukee, Wisconsin



GLOBE

SPECIALIZATION GIVES YOU UNIFORM HIGH QUALITY IN ALLOY STEEL TUBES



When you specify GLOBE you get the finest, because Globe *specializes* in the production of steel tubes. For more than thirty years Globe *specialized* research, engineering and manufacturing facilities have assured customers of uniform high

quality in alloy steel tubes for pressure or mechanical applications.

GLOBE STEEL TUBES CO., Milwaukee 46, Wis.

Chicago • Cleveland • Detroit • New York • Philadelphia
St. Louis • Denver • San Francisco • Glendale, Cal.

Producers of Globe seamless stainless steel tubes — Gloweld welded stainless steel tubes — alloy — carbon — seamless steel tubes — Globeiron (high purity ingot iron) seamless tubes — Globe Welding Fittings.

**GLOBE SEAMLESS TUBES
FOR MAXIMUM STRENGTH
AND MINIMUM WEIGHT**

TYPICAL ANALYSES:

Carbon Moly.

1-1/4 Chrome 1/2 Moly • 1-3/4 Chrome 3/4 Moly

2 Chrome 1/2 Moly • 2-1/4 Chrome 1 Moly

5 Chrome 1/2 Moly • 7 Chrome 1/2 Moly

9 Chrome 1 Moly

A1S1 1335 • A1S1 2317 • A1S1 2512 •

A1S1 4130, 4140 • A1S1 4615 • A1S1 8615,

8620, 8630, 8635, 8640 • 7% Ni. • 9% Ni.

TYPICAL APPLICATIONS

Pressure Tubes — Superheater

Tubes — Condenser Tubes — Still

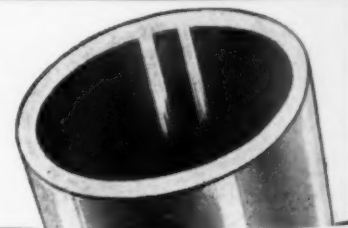
Tubes — Evaporator Tubes —

Barrel Tubes — Oil-Well Pump

Barrels — Mechanical Tubes —

Aircraft Tubes—Rollers for Trans-

mission Chains



Pierced from solid steel billets . . . with no seams or welds, Globe seamless tubes are available in many sizes and wall thicknesses for exacting applications.



MULTIPRESS®

**The answer to 1000 and 1
production problems**

DENISON
Hydr-OIL

*Turn the page and
see the proof* →

Case Studies Like These Prove Versatility of

MULTIPRESS

STRAIGHTENING

Accura
over 1
and pr

BLANKING

Rejects droppe

MARKING

COINING

FORMING

SHAVING

BENDING

CRIMPING

FLARING

TRIMMING

Piercing and emb
mocc
6 to

PRESSING

A single Multipress opera
thin-walled m

EMBOSSING

A 50-ton Multipress forms 12-gaug

TESTING

Exact dimensions must be he
g ma
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as

STAMPING

Safety of operation was an all
more than doubled
Eight precision flaring operations are
multaneously on hollow steel
without marring

SWAGING

DRAWING

A 6-ton Multipress equipped
trically heated platens is used
or forming the

STAKING



RIVETING

At a speed of 2000 contacts per hour, this 4-ton Multipress rivets silver points on spring steel and brass contact arms at the Chicago plant of one of the country's largest electric appliance manufacturers. The press is equipped with six-station Multipress Index Table powered by the hydraulic system of the press and positioned...



RIVETING

Production was boosted 100% on motor cycle-wheel subassemblies with this 25-ton Multipress. Other advantages included slashing of rejects to less than half of one per cent... the need for re-straightening finished assemblies dropped from 89 per cent to zero... stronger assemblies resulted from use of...



ASSEMBLING

34-piece automobile door latches are completely assembled at the rate of 12,000 finished units per day. Thirteen Multipresses in this ingeniously arranged production line assemble auto door latches made up of 34 separate parts, in a series of closely integrated operations handled by 30 women operators. Eleven of the Multipresses are equipped with HydroILic Index Tables, feeding of parts to the press



ASSEMBLING

Boosting production from 900 assemblies per hour to more than 1500, this 25-ton Multipress automatically assembles a square-shank bolt to the base of an insulator holder. In addition to this 66% faster production, Multipress does the job more accurately, with fewer rejects, and makes the work easier and safer for the operators. Bolts are set in the holders and placed in fixtures on the six-station HydroILic Index Table with which



BROACHING

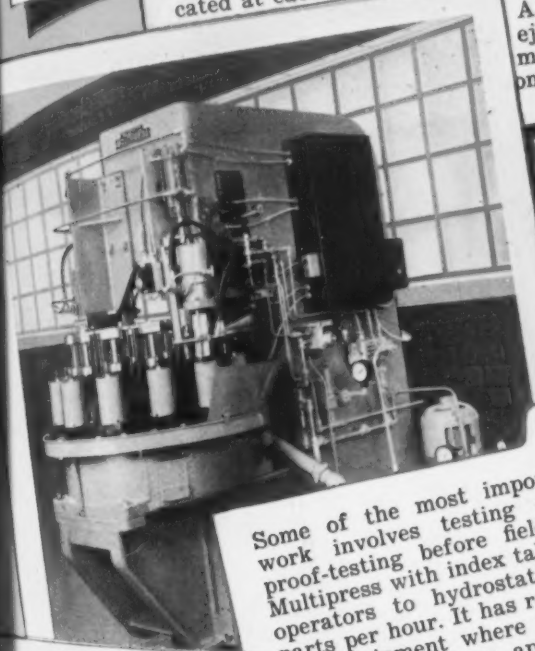
Three times the speed of the previous equipment is attained on this 6-ton Multipress, in broaching splines on small crankshafts that operate automobile windows. Broaching fixtures located at each of the six stations on the

to beneath
A knock-
ejects fin-
m tooling
omatically



SWAGING

Production rate 800% faster! A swaging operation that used to take more than three minutes is now done in 24 seconds on this 8-ton Multipress. The job is to taper half-inch steel tube into caulking gun tips or nozzles, in three standard sizes— $\frac{1}{8}$ ", $\frac{1}{4}$ " and $\frac{3}{8}$ ". In addition to



TESTING

Some of the most important defense work involves testing operations... proof-testing before field usage. This Multipress with index table enables two operators to hydrostatically test 600 parts per hour. It has replaced methods where 7 men were required to produce approximately 100 parts per hour.



TRIMMING

Cutting dies stay sharp up to 50% longer when Multipress is used to trim flash and gate from die castings. The smooth hydraulic ram action, applied with a continuous "push" instead of a hammer-like blow, is easier on dies, and parts. Uneven



CRIMPING

Production speed more than doubled—jumped from 500 pieces per hour to 1100—when this 4-ton Multipress was applied to the tricky job of crimping thin metal tubing to ceramic bushings used in the manufacture of electronic components.



STAKING

A six-part assembly job handled at rate of 4500 per day! Better assemblies, fewer rejects, less breakage and other production gains were quickly realized when this manufacturer of electrical equipment switched to Multipresses for intricate assembly work.

NEXT PAGE SHOWS HOW MULTIPRESS DOES IT



ONLY MULTIPRESS

offers all these production boosting advantages

- Pressure adjustment is infinitely variable
- Ram speeds up to 1300 inches per minute
- Sizes from one ton through 50-ton range
- Stroke can be pre-set to either distance or pressure limits
- Approach and pressing speeds are independently adjustable
- Controls for time delay, hydraulic interlock, and sequence operations
- Exclusive Vibratory Ram Control permits rapid repeat strokes
- Rapid traverse

- can be combined with controlled pressing speeds
- Manual or automatic ram controls
- Dual controls for maximum safety
- Highly compact design saves floor space
- Ideally suited for operation by unskilled workers
- Controlled working speeds cut rejects, reduce die wear
- Quieter, smoother operation reduces worker fatigue
- Tailored to individual production needs for highest efficiency.

In addition to new levels of operating speed, efficiency, precision, and ease of adjustability to changing needs, Multipress offers basic advantages that bring improvements on almost every type of application. Its oil-smooth hydraulic action means that pressures are always applied in a steady, even flow of controlled power—and not with sudden, hammer-like blows—no matter how rapidly pres-

sure is applied. This results in less chance for damage or distortion of parts, less strain on materials, less wear and tear on dies, and quieter action that is less fatiguing.

Multipress is tailored to individual production needs, in eight different frame sizes. Write today for complete information, or for recommendations based on your specific requirements.

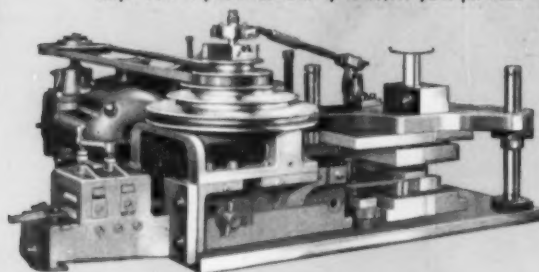
The DENISON Engineering Co. 1158 Dublin Road Columbus 16, Ohio



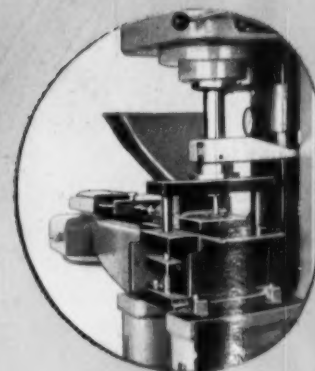
Multipress offers the exclusive Harmonic Stock Feed, for high speed blanking, forming or punching, from continuous metal strip. Permits production rates up to 50,000 parts per hour.

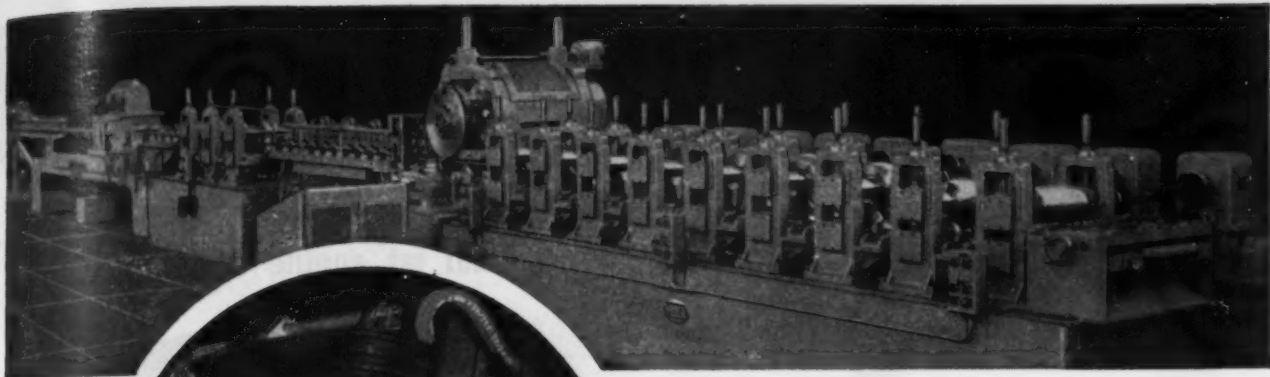


Six and 12-station Multipress Indexing Tables, driven by the hydraulic system of the press, are available on all automatic Multipress models, to feed parts automatically to the press ram.



Multipress Shuttle and Accessories provide automatic feeding, pressing, and ejection of low-granular or powdered materials.





IMPORTANT ADVANCE IN

Tube Welding

Up to 20% Higher Production

Yoder now announces the greatest forward step in tube welding since the introduction of the first patented Yoder Tube Welder in 1939. The enviable production records established by this welder largely account for the fact that Yoder has furnished more than half of all the resistance-weld tube mills since installed in the U.S.A.

The heart of the new welder is a transformer of revolutionary design. It consists of four smaller transformers surrounding a common core and making an assembly of unprecedented compactness and strength. Reduced impedance accounts for its higher electrical efficiency. It insures longer service life, fewer

interruptions for servicing, repairs and maintenance.

Compared with the previous Yoder welder, the production gains may be as high as 20%; compared with other tube welders, the gain may be as high as 50 to 60%. These gains go far toward compensating for increased labor and material costs.

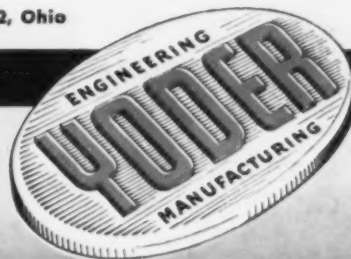
The welder is furnished with all new Yoder tube mills, and is also available for replacing welders in other makes of resistance-weld mills, to step up production and reduce conversion cost.

Descriptive literature, consultations and estimates for the asking.

THE YODER COMPANY • 5510 Walworth Avenue • Cleveland 2, Ohio

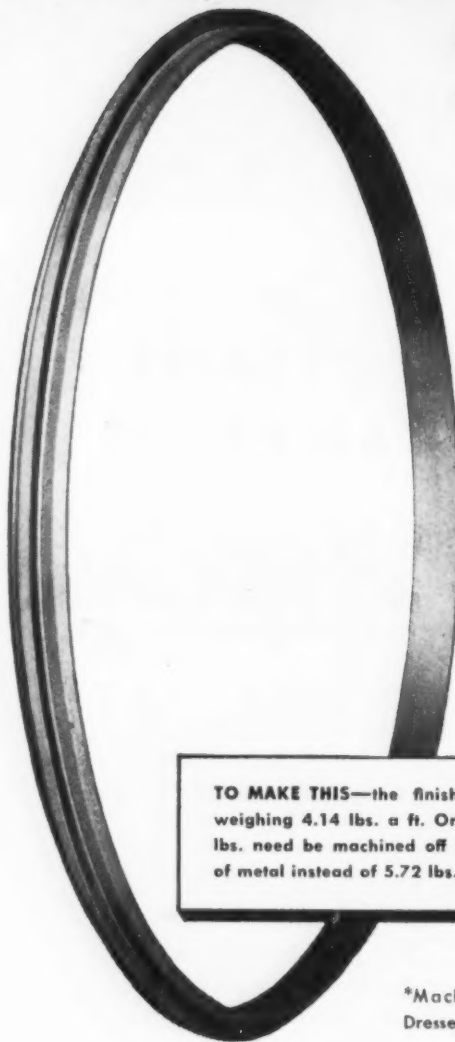
Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

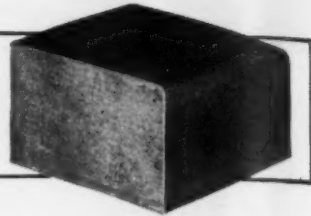


SAVE STEEL . . . MANPOWER . . . MACHINING WITH
DISSTON[®] HOT ROLLED SHAPES

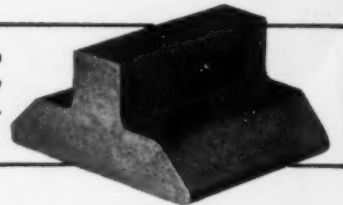
How Firestone Tire & Rubber Company saves 45.2% steel in making special jet engine container rims:



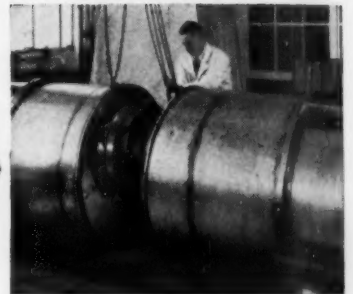
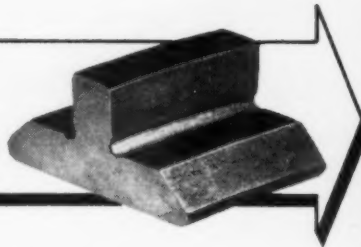
INSTEAD OF THIS—a full-section steel bar weighing 9.86 lbs. a ft. . . .



THEY* START WITH THIS—a Disston Shape, hot-rolled to close tolerances, weighing only 5.4 lbs. a ft. . . .

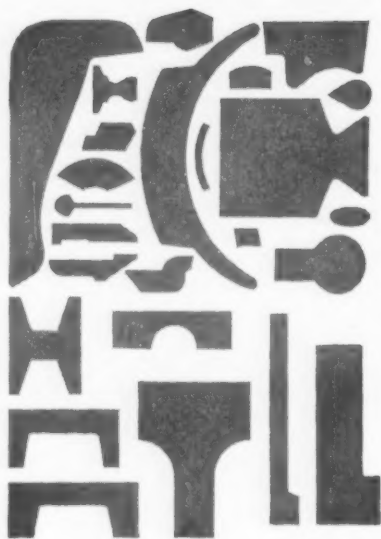


TO MAKE THIS—the finished rim weighing 4.14 lbs. a ft. Only 1.26 lbs. need be machined off each ft. of metal instead of 5.72 lbs.!



*Machining and rim fabrication by Dresser Manufacturing Div., Bradford, Pa.

Firestone's jet engine container is in two halves which are attached by a series of clamps affixed to a machined rim. This rim is made from a special Disston Hot Rolled Steel Shape and helps make a joint capable of carrying structural loads.



A few of the many forms of Disston Hot Rolled Shapes now being used by industry.

This actual case history demonstrates typical savings made for many industries using Disston Hot Rolled Steel Shapes. Such shapes can be rolled in a variety of forms to meet exact specifications. Tolerances are close, and fine finishes can be furnished. These shapes can be made in either alloy or carbon steels, in both electric and open hearth grades. Disston engineers and metallurgists will be glad to work with you in developing the special shapes that will give you the greatest economies. Write us, specifying your needs.



SCRAP TURNED IN IS STEEL TURNED OUT!

Steel mills urgently need more scrap now! Help yourself get more steel by keeping your scrap moving into channels serving steel mills.

HENRY DISSTON & SONS, INC.

919 Tacony, Philadelphia 35, Pa., U.S.A.

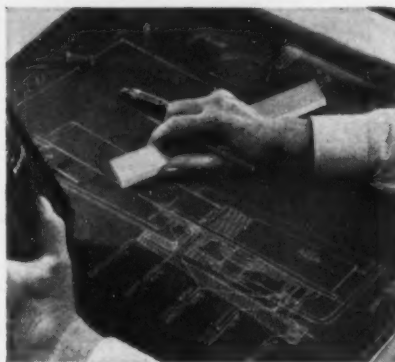
For Defense
or Essential
Civilian Use—

get the
most

for your
**Zinc Die Casting
Dollar!**

ASK FOR DESIGN HELP . . .

The surest way to realize the full economies inherent in the die casting process is *early* consultation with a competent die casting engineer—before the design has advanced so far that changes are impossible or impractical. Any die casting company will be glad to have an engineer help you in adapting the design of a part to its most economical production by the die casting process.



USE OUR BOOKLETS . . .

To help prospective die casting purchasers, The New Jersey Zinc Company has prepared booklets giv-



ing up-to-date information on ZINC Die Castings. These booklets cover alloys, design, machining, finishing and applications. We will be glad to send copies of any of these booklets to you—or they may be obtained through any die casting company.

SEE OUR EXHIBIT AT THE METAL SHOW . . .

Each year The New Jersey Zinc Company, on behalf of the die casting industry, assembles a comprehensive exhibit of ZINC Die Castings at the National Metal Exposition. If you are planning to attend this year's Exposition in Detroit—October 15 to 19—be sure to visit with us in Booth A 162 (Building "A"). Here is your opportunity to see many examples of the best in die casting design and to learn—first hand—how to get the most for your ZINC Die Casting dollar!



VISIT BOOTH A 162 AT THE METAL SHOW

The New Jersey Zinc Company, 160 Front St., New York 38, N. Y.



ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC



NO SCRAP... NO STEEL!



SCRAPPY SAYS:

AID DEFENSE
MORE SCRAP
TODAY...
MORE STEEL
TOMORROW



THE iron and steel industry faces a serious scrap shortage, growing more critical every day. . . . It will be impossible for producers to make the steel tonnages demanded for rearmament and essential civilian needs, unless consumers cooperate by furnishing more scrap. . . . Most desperately needed now is heavy industrial iron and steel scrap. . . . Keep the cobwebs from gathering at your own plant by turning in more of your own scrap today.

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio

Export Offices--500 Fifth Avenue, New York

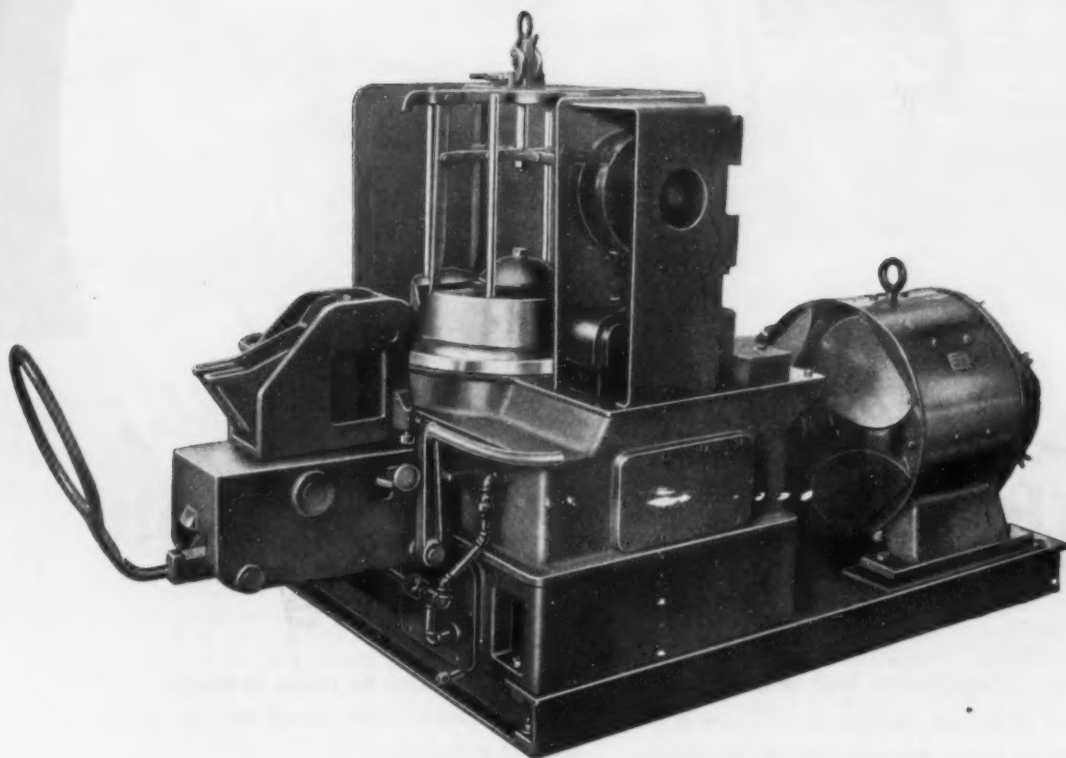
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

MORGAN Wire Blocks

WORCESTER

*....draw a complete
range of sizes*



Morgan Wire Blocks are built for high output, low power requirement, convenient and safe operation.

Morgan's line of single block, vertical spindle machines is built in several sizes, with various block diameters and speeds to handle any type of work. Also available are double deck blocks for two drafts.

Write us about your problem and let us recommend the machine that will most efficiently handle your work.

WM-52

MORGAN CONSTRUCTION CO. WORCESTER
MASSACHUSETTS

ROLLING MILLS • MORGOIL BEARINGS • REGENERATIVE FURNACE CONTROLS • AIR EJECTORS • PRODUCER GAS MACHINES

September 27, 1951



Over the Long Haul

The FERRY CAP Spring Bolt Proves its Mettle

This Ferry Cap Spring Bolt is one of hundreds of different designs which we make for leading truck manufacturers. We manufacture them to various head shapes, with oil holes and grooves of different kinds, and flats accurately milled. Precision is a principle at Ferry Cap.

The bolt has maximum ground surface-wearing qualities. It is case hardened to proper depth, achieving a hard surface with a relatively soft core, assuring both long wear and high fatigue strength. The thread

end is annealed to make it tough, but not brittle—more than equal to the required thread strength.

The body is ground to close tolerance, oil holes expertly drilled, and flats milled to a smooth, true surface to allow free flow of lubricants. The cotter holes, accurately drilled, are free from burrs. Result—the bolt fits perfectly.

It is a spring bolt of which any truck manufacturer can well be proud—a clean cut, precision-made, long-wearing, tough, dependable product.

The FERRY CAP & SET SCREW Co.

2157 SCRANTON ROAD

CLEVELAND 13, OHIO

CAP AND SET SCREWS • CONNECTING ROD BOLTS • MAIN BEARING BOLTS • SPRING BOLTS AND SHACKLE BOLTS • HARDENED AND GROUND BOLTS • SPECIAL ALLOY STEEL SCREWS • VALVE TAPPET ADJUSTING SCREWS • AIRCRAFT ENGINE STUDS • ALLOY STEEL AND COMMERCIAL STUDS • FERRY PATENTED ACORN NUTS

TOUGH!—extreme hardenability, high tensile and fatigue strength, withstands 200,000 p.s.i. working pressures.

HARD!—can be oil-quenched in moderate sections to a maximum hardness of Rockwell C65/66.

EASY TO MACHINE!—excellent machinability because of fully spheroidized structure.

Ideal for parts like these:

1. Diesel injection pumps
2. Lathe centers
3. Slitting rolls and knives
4. Cam rollers for automotive steering gears
5. Machine tool parts
6. Pump parts
7. Aircraft engine parts
8. Mechanical seals
9. Saw mill rollers
10. Anti-friction bearings
11. Asbestos disintegrators
12. Mill rolls

—that's 52100 steel!

Here's a high carbon chromium steel that offers big advantages to manufacturers of machined parts requiring great strength and high resistance to wear. It's 52100 steel—originally developed by the Timken Company for anti-friction bearings.

Because it's hard and tough . . . and because of its excellent machining characteristics, 52100 is the ideal steel for a wide variety of applications. It has high fatigue strength and high tensile strength. When oil-quenched in moderate sections it has a maximum hardness of Rockwell C65/66. And it withstands a working pressure of 200,000 p.s.i. What's more, it's easy to machine—a result of spheroidized annealing.

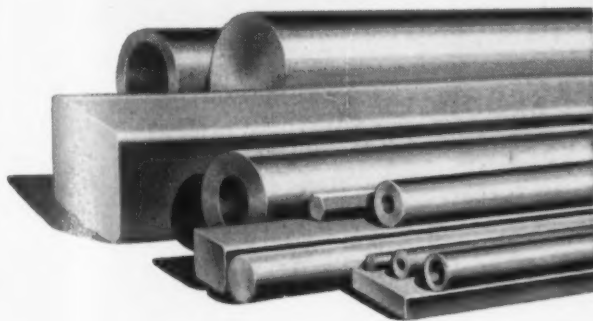
The Timken Company—one of the world's largest producers of 52100—is the *only* source from which you can get *all three* finished forms of 52100 steel. Bars, tubes,

and wire are available in a wide range of sizes. And for small run or emergency requirements, the Timken Company maintains a mill stock of 101 sizes in 52100 tubing—from 1" to 10½" O.D. Shipment is made within 24 hours after your order is received!

Most important, you can depend on uniformly high quality in every shipment of 52100 steel from the Timken Company. Quality is rigidly and completely controlled at every step in production—from melting to final inspection.

Write today for a stock list of available sizes, grades and finishes. And for detailed information on how 52100 steel can meet your particular need, consult our Technical Staff. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



TIMKEN

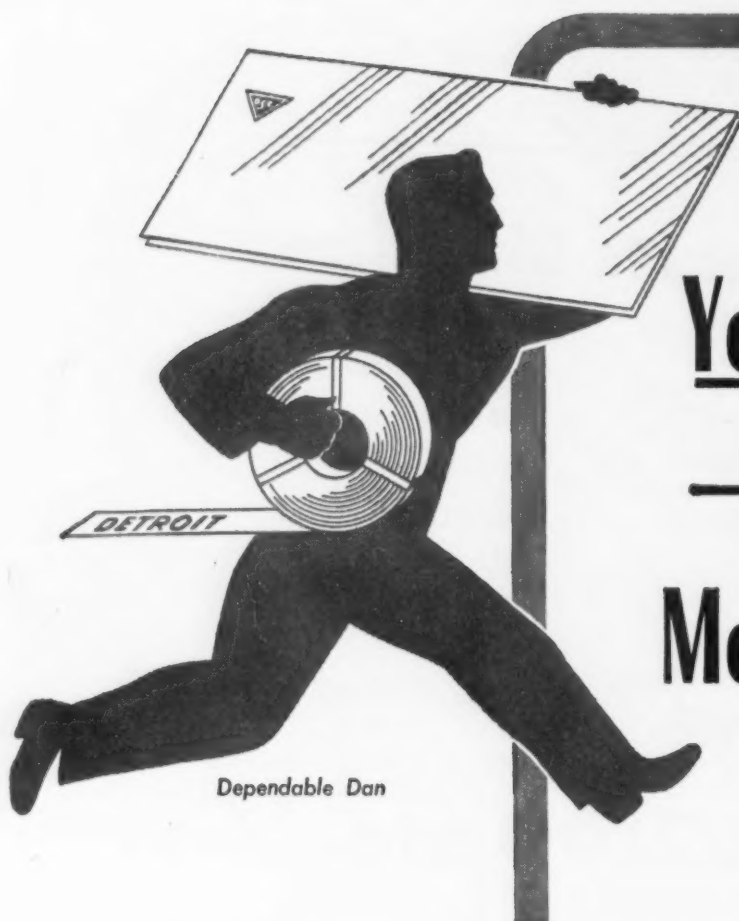
TRADE-MARK REG. U.S. PAT. OFF.

Fine Alloy

STEEL

and Seamless Tubes

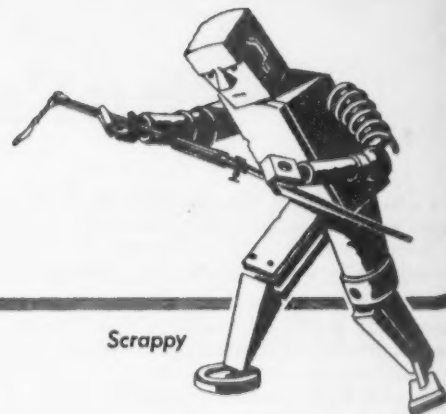
Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing



Dependable Dan

Turn Your Scrap In —Help Turn More Steel Out

The Bigger The Scrap Pile Now
The Bigger The Steel Production
Next Winter



Scrappy

DETROIT STEEL CORPORATION

PRODUCERS OF

Coke and Coal Chemicals • Pig Iron • Ingots
Slabs • Sheet Bars • Billets • Wire Rods
Manufacturers' Wire • Merchant Wire Products
Welded Fabric • Cold Rolled Strip Steel

GENERAL OFFICES
DETROIT 9, MICHIGAN

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RELIANCE STEEL DIVISION

Processors and Distributors **JOB-FITTED** Sheet and Strip Steel

GENERAL OFFICES — BOX 4308 — PORTER STATION, DETROIT 9, MICHIGAN

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RELIANCE *Job-Fitted* PRODUCTS

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Coils . . . Cut Lengths . . . All Tempers

SHEETS

COLD ROLLED . . . HOT ROLLED . . . H. R. PICKLED . . . LONG TERNE . . . GALVANIZED

Standard and Production Sizes or Cut to Actual Working Dimensions

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**By any
standard . . .**

LINK-BELT ball and roller two-piece housing facilitates mounting assembly

Mounting Link-Belt two-piece housing pillow blocks to your assembly is a quick, easy job. The dowel pin holes are tapped so that a standard threaded bolt can serve as a jack screw to raise the cap for installation. Then just slip the adapter assembly onto the shaft and lock securely into position.

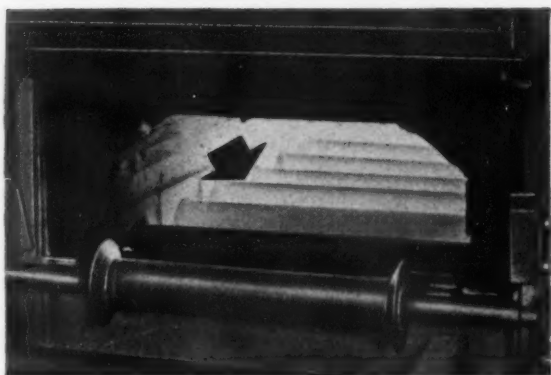
There are many other Link-Belt design advantages.

Our bearing specialist near you will show you how to apply them efficiently to your application. And you'll find complete engineering information in Data Book 2550.

LINK-BELT

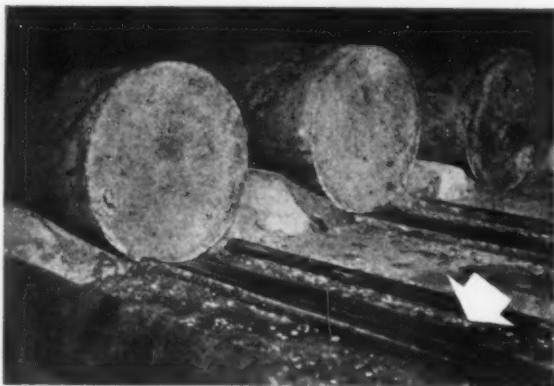
Ball and Roller Bearings

LINK-BELT COMPANY: Indianapolis 6, Chicago 9, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in principal cities. 12, 284



Gas Machinery Company

HEAT? Instead of using metal rollers, the manufacturer of this annealing furnace applied a Super Refractory roller-hearth. As a result, the hearth stays straighter, lasts longer, and reduces marking and pick-up.



ABRASION? The skid rails supporting these brass billets were formerly made of alloy. The alloy skids required complete replacement every two to five weeks, constant maintenance between times. When replaced with Super Refractory skids, the new rails required no attention for over three years.



CORROSION? An interesting application of Super Refractories where no heat is involved is this wire guide. It supports newly drawn steel wire as it passes along the bottom of a tank during zinc coating. It seems to be the only material that will stand up at all under the cutting action of the wire and the corrosive action of the plating solution.

Super Refractories by

CARBORUNDUM

TRADE MARK

Refractories Division

"Carborundum" is a trademark indicating manufacture by The Carborundum Company

30

CAUGHT for heat

Here's a group of materials often used in place of certain metals—Super Refractories by CARBORUNDUM. Possessing properties seldom associated with refractories, these materials have often proved superior to the metals they replaced; have been invaluable where critical nickel, chrome, or cobalt alloys were involved.

For example, Super Refractories have replaced metals for such diverse applications as: skid rails, muffles, wire guides, radiant tubes, roller hearths, hot blast mains, brazing fixtures, recuperator tubes, etc. In these cases, they not only *released* vitally needed metals but *outperformed* them (by lasting longer than the metals — while also increasing the capacity of the equipment).

As you look over the properties of Super Refractories listed opposite, draw a mental comparison with your needs. Exactly what makes an alloy essential in this place, or that? Is it refractoriness? conductivity? abrasion? corrosion? strength? It's surprising how often you'll find Super Refractories inherently better — and far less expensive — than metals.

It will pay you to investigate these interesting Super Refractories . . . *now*, before the metals cupboard is bare. Won't you write or call us today?

The Carborundum Company, Perth Amboy, N. J.

THE IRON AGE

T IN THE SQUEEZE t resisting metals?

SUPER REFRACTORIES ARE IDEAL WHERE

HIGH HEAT IS INVOLVED. Super Refractories are very strong and durable—can be safely used at temperatures over 3000 F. Compare this with 25-12 chrome-nickel steel, for example, which loses strength rapidly over 1500 F. and cannot be used with safety above approximately 2100 F.

ABRASION OR EROSION ARE PRESENT. Two types of Super Refractories are within one index point of diamond hardness! They are the toughest known materials for large scale commercial use. They will distinctly outwear metals—especially at furnace temperatures.

HEAT CONDUCTIVITY IS NEEDED. At elevated temperatures, one Super Refractory material conducts heat *almost as rapidly as chrome-nickel steels*. It's widely used in equipment involving heat transfer. There are also Super Refractories which are good insulators, particularly at high heats.

STRENGTH IS IMPORTANT. Super Refractories are generally very strong, and *retain* their strength at temperatures where metals become unusable. For example, the modulus of rupture of one composition averages 3100 psi, at 2460 F. No commercial tonnage refractories have greater strength.

CHEMICAL ACTION IS PRESENT. In general, most Super Refractories are either neutral or acid in nature—are widely used where chemical inertness is important.

SPECIAL SHAPES ARE INDICATED. Practically all Super Refractories are available in a wide variety of construction shapes molded to close tolerances—including fitted joints, tubes, etc.



USE THIS BOOKLET TO CHECK UP. This new booklet contains an easy-to-read analysis of the principal characteristics of these unique Super Refractories. The coupon will bring you the story—or one of our engineers will be happy to talk over your problems. We believe it could be mutually profitable.

Dept. Y-91
Refractories Div., The Carborundum Co.
Perth Amboy, New Jersey

Please send me your free booklet on the properties of Super Refractories.

Name _____

Position _____

Company _____

Street _____

City _____ Zone _____ State _____

ONCE AGAIN the nation's steel production depends on you!



Scrap iron and steel are vital to the production of steel . . . and America's mills are turning out over 100 million tons of ingot steel annually. That takes a lot of scrap!

Yet lack of scrap may cause steel production to sag . . . right when our nation needs more steel than ever. And there's only one way to meet the need: Get in *all* the scrap that you can, *now*.

You can help now . . . this way

Check your plant or factory—check the grounds, too. Gather up all the scrap steel—old or obsolete machinery and equipment, rusting tanks and boilers, rails and sheets. Your local scrap dealer will pay you today's good prices and start this vitally needed material on its way.

Production is the key to solution of many national problems . . . and production requires steel. Help keep production high by getting in the scrap!



WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL



CORPORATION

..... the "BIG BOOST" in tooling



From "The Osbornite" published by and for the Employees of the Osborn Manufacturing Company, Cleveland, Ohio.

Chuck Corwin reads greeting card rigged up by co-workers on his new Bullard Cutmaster.

Quality, Production, Get Big Tooling Boost

How would you like to get a 16-ton Christmas present? That's what happened to Chuck Corwin (Machine Shop). Such a gigantic piece of equipment was this gift, that Chuck decided he'd have to leave it here at the plant where he could enjoy it during the day's working hours.

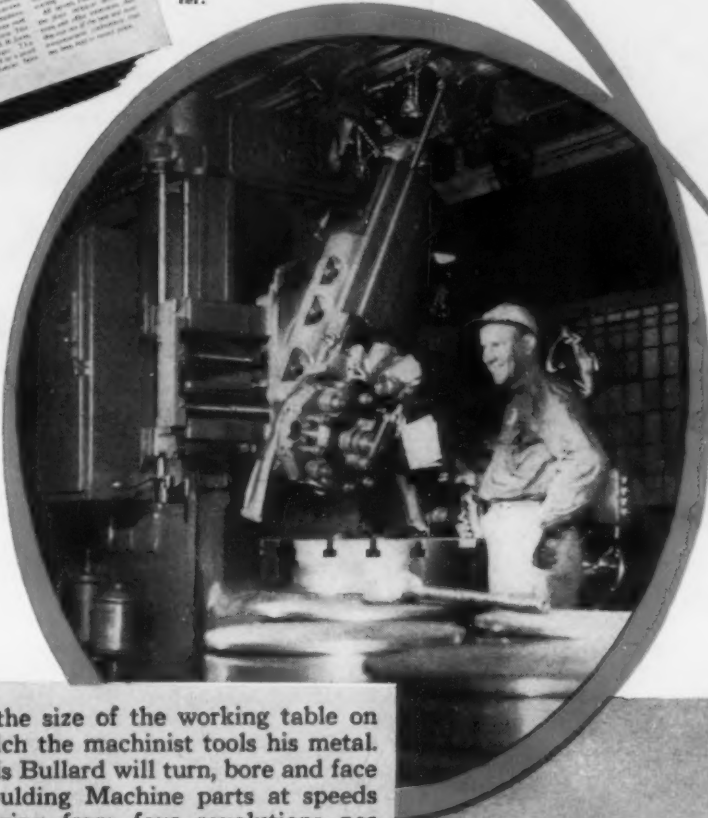
Now 32,000 pounds worth of heavy machinery is a very unusual kind of Christmas present for one man, but in the case of Chuck's new machine—the big 36" Bullard Cutmaster, all of us can get a lot out of it in more ways than one.

Installation of this major piece of plant machinery can be counted on to consolidate more firmly our ability to produce more. It can handle tooling of larger parts than we have been able to make up to now so it will increase the scope and range of the Moulding Machines we can sell to our customers. And that, in turn, certainly benefits us all.

Without getting too technical, we'd like to tell a little about what this new Bullard can do and how it does it. First, let's take that designation, "36". It refers not to the size of the machine itself, for anyone can see that it takes up space from the floor almost to the ceiling of the Machine Shop. Thirty-six inches refers simply

to the size of the working table on which the machinist tools his metal. This Bullard will turn, bore and face Moulding Machine parts at speeds ranging from four revolutions per minute all the way up to 210 r.p.m. You can have two tools in work at one time on this mill by using the side jack and the turret head simultaneously.

Yes, we can all expect great things from this Bullard Cutmaster which, incidentally is the third such mill to be installed recently. One of the others has a 54" table for tooling even bigger parts for our Moulding Machines. All are controlled in the hydraulic system by solenoid action, and accommodate the newest type carbide tooling.



THE
BULLARD
COMPANY
BRIDGEPORT 2,
CONNECTICUT

Pre-Assembly Cuts Costs

...IMPROVES PERFORMANCE, TOO!



EXTERNAL

Lower costs are certain with SEMS-by-SHAKEPROOF because the costly operation of putting lock washers on screws by hand is completely eliminated.



INTERNAL

Specially designed Shakeproof Lock Washers provide positive vibration resistance.



COUNTERSUNK

Two parts are handled as one, even in flat or oval head screw applications.



THREE-PIECE

For even greater actual assembly can be pre-assembled to screw.

SEMS-by-SHAKEPROOF

T. M. REG. U. S. PAT. OFF.

FEATURING SHAKEPROOF LOCK WASHERS WITH TAPERED-TWISTED TEETH!

SEND FOR THIS FREE SAMPLE KIT...

Learn why it is important to specify Shakeproof Lock Washers when ordering Sems—test this better fastener on your own product, now!



HAVE YOUR PRODUCT
"FASTENING ANALYZED"

Let a Shakeproof engineer study your product to see if improved fastening methods can reduce your costs. Write for details, today!



NEW

SHAKEPROOF POWER SCREW DRIVER

It's hopper fed . . . to reduce piece handling and assembly costs! Handles Sems units of any head style as well as ordinary screws and Shakeproof Thread-Cutting Screws. Assures proper tightening torque for maximum fastening efficiency. Write for illustrated folder today!



SHAKEPROOF Inc.

DIVISION OF ILLINOIS TOOL WORKS

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FREE-PICTURE
greater assembly
pre-assembly
crowd

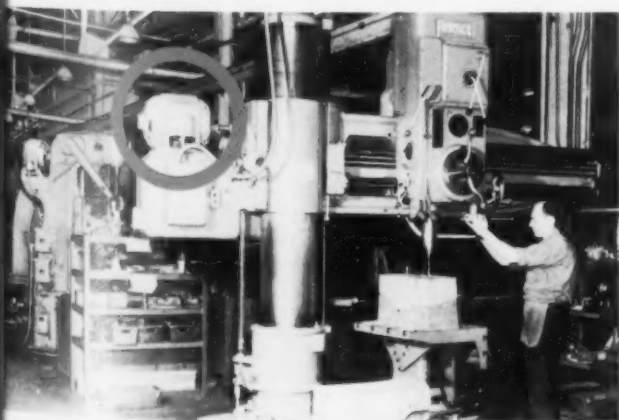


"We have three shifts in operation," says Julius J. Domonkos, Vice-President in Charge of Manufacturing, Bell Aircraft Corporation. "That's full production on a 24-hour day basis. For the past 10 years we've been depending on Tri-Clad motors to carry the load. We've never regretted putting our confidence in this fine motor!"

G-E Tri-Clad Motors drive the machines that are instrumental in producing helicopters, guided missiles, rocket motors, research aircraft, and jet aircraft engine nacelles for our rapidly expanding armed forces. At Bell Aircraft Corporation, G-E Tri-Clads are known as a thoroughly dependable motor—tough on the outside... on the inside... at the bearings.

BELL AIRCRAFT CORPORATION:

"We've been depending on Tri-Clad* Motors for Ten Years..."



This Tri-Clad driven radial drill takes care of most of the large dies in the entire Bell plant. Big dies and bolster plates are drilled and tapped on this machine, a critical part of the Bell operation. Despite continuous use, plant personnel can't remember a single interruption due to Tri-Clad failure!

FASTEST BOMBER IN THE WORLD! Jet engine nacelles for the 600-plus miles-per-hour B-47 are being produced at a record-breaking clip in the Bell plant at Buffalo, N. Y. The "Stratojets" represent a major advance in bombardment aircraft.

*Reg. trademark of General Electric Co.

GENERAL  ELECTRIC



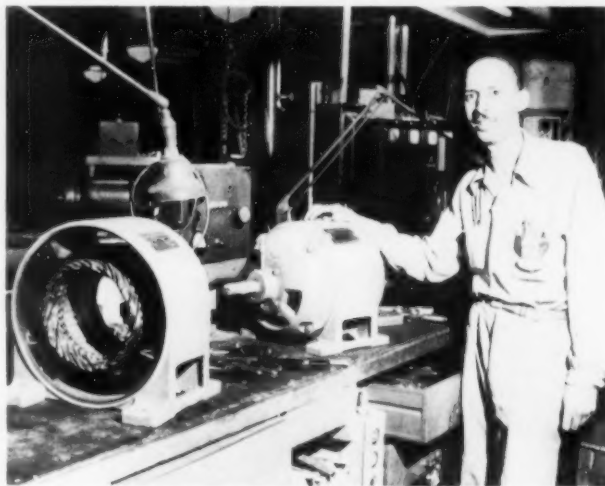
TRI-CLAD MOTORS

REG. U. S. PAT. OFF.

Help keep Bell Aircraft production up!



Marvin Limburg (left), Foreman of Bell's Tool and Die Shop, comments, "I don't believe we've ever lost machine time due to breakdown of Tri-Clad motors. And our jig-borers, for example *have been operating around the clock for the last 8 to 10 years!*"

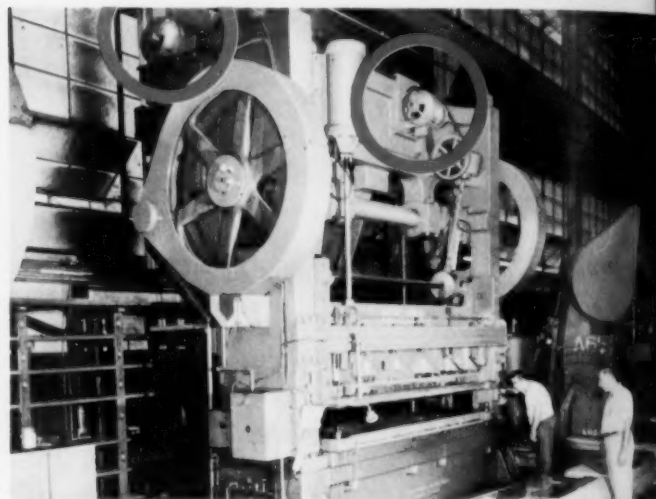


"It's the easiest motor we have to maintain" according to Maxwell Anderson, Crew Chief of Bell's motor repairmen. "There's more working room inside and more room in the slots. It's become a byword with us that if you give a Tri-Clad motor ordinary care you'll never have to worry about maintenance."

TIMELY READING—With every electric motor needed on the line, you'll want a copy of the G-E manual on "How to Maintain Motors and Generators." It's free; just ask for bulletin GET-1202. Sect. 752-10, General Electric Company, Schenectady 5, N. Y.



Greasing isn't necessary on a Tri-Clad motor in normal service, but it's always reassuring to know that you *can* lubricate if you so desire, without time-consuming disassembly. The photo shows how easy it is: remove relief plug, attach the grease gun nozzle, squirt—the job is finished.



This huge punch press is an important tool maker. Anton Geiser (right), assistant punch press foreman, says: "I can't recall a single shutdown of this section due to motor failure." Almost all motors in this department are Tri-Clad. This is another Bell Department which has been operating around the clock; cannot afford to lose time because of motor breakdown.

NEW! A Helpful Training Course on Motors!

Everyone concerned with technical training problems will want this new G-E Motor Selection and Application Course. Consists of 9 short, easily understood lessons. Complete kit—slide films, review booklets and instructor's manual—\$100.00. Call or write your nearest G-E sales office.

Look at the Scope of this Course



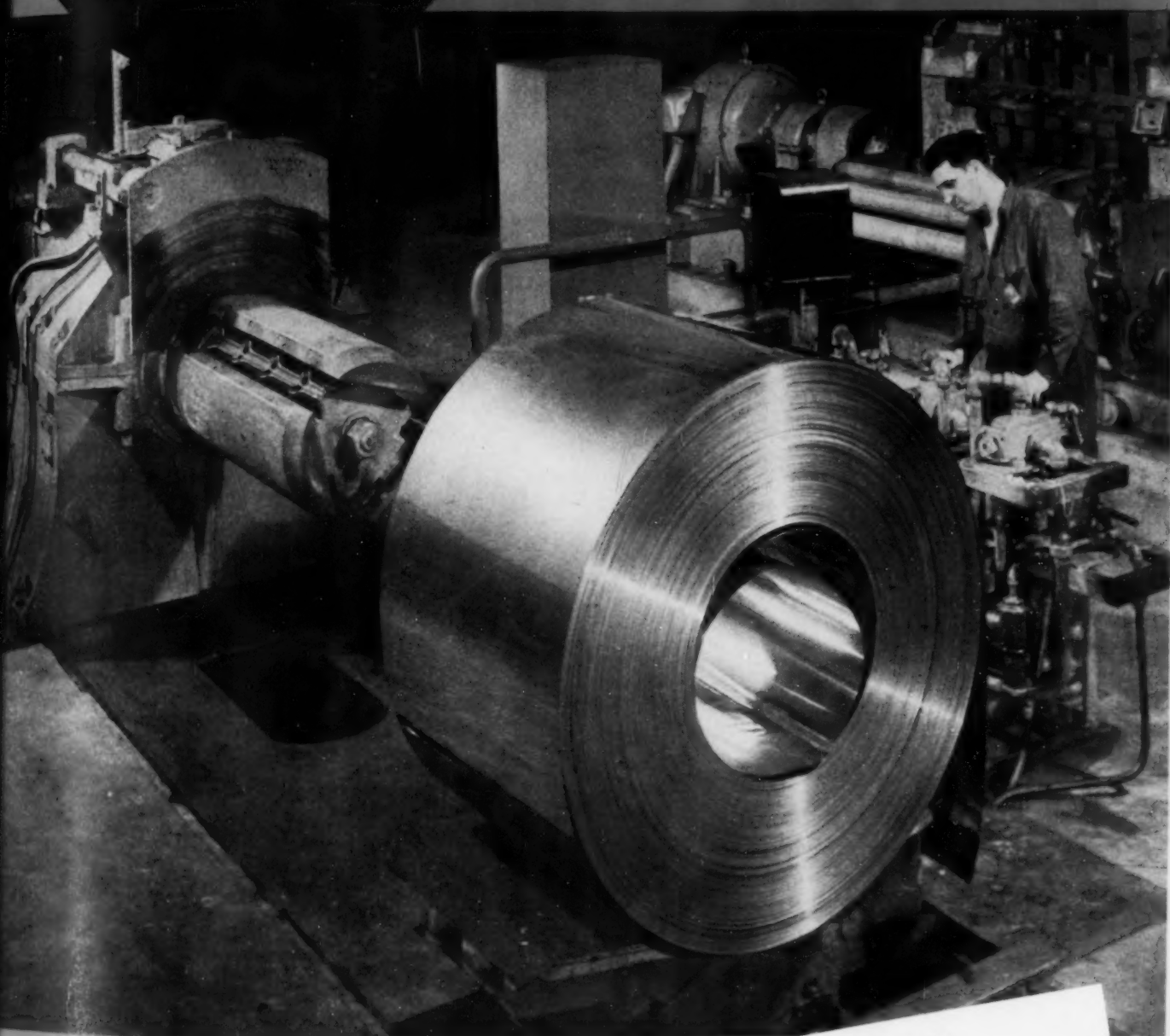
- | | |
|------------------------------|----------------------------|
| 1. Fundamentals of Motors | 5. Single-phase Motors |
| 2. Types of Motors | 6. D-C Motors |
| 2. Fundamentals of Selection | 7. Synchronous Motors |
| 4. A-C Induction Motors | 8. Adjustable-speed Drives |
| 9. Gear Motors | |

GENERAL  ELECTRIC



WEAN PAY-OFF AND WINDING REELS

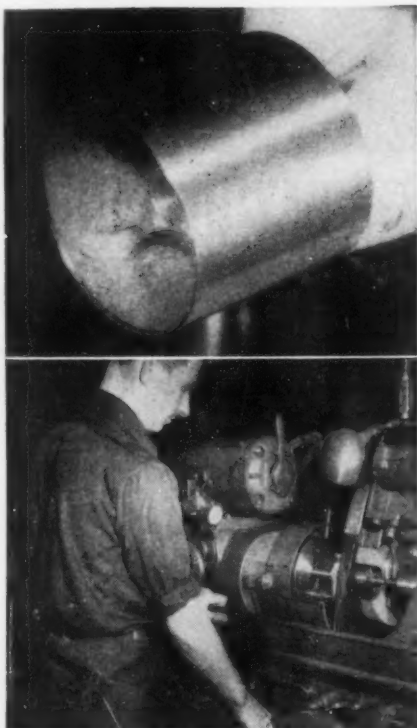
are designed to handle the largest coil weights made today



**SPECIALISTS IN SHEET, TIN
AND STRIP MILL EQUIPMENT**



THE WEAN ENGINEERING CO., INC.
WARREN, OHIO



Photos courtesy of Universal Winding Company

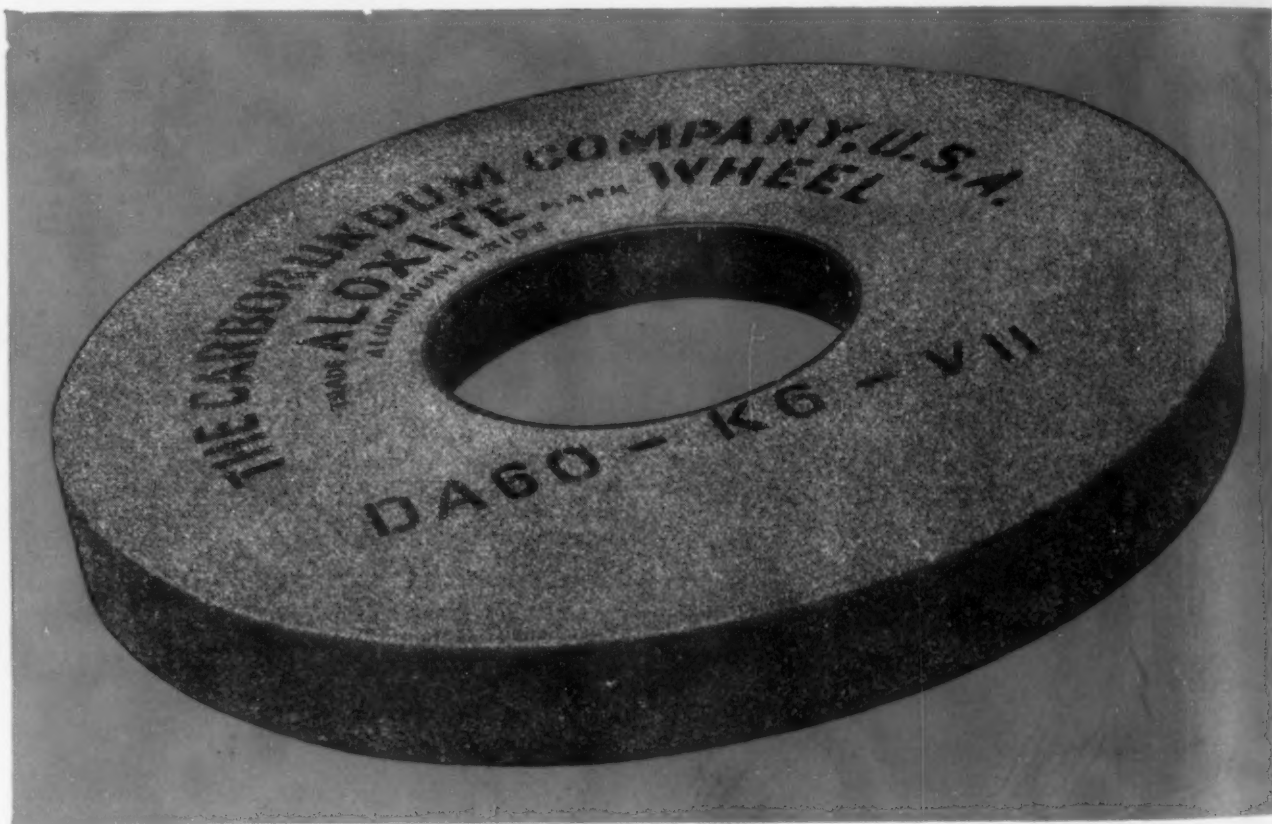
Smooth as silk...to protect nylon

Because delicate nylon must pass over these rolls without danger of damaging rips—the stainless steel surface must be ground to the smoothest of finishes.

Universal Winding Company reports that V11 Bond grinding wheels are perfect for the job because of excellent form holding qualities at reduced grinding pressures.

Cool, free cutting action produces superior finishes to close tolerances; more rapid stock removal results in high production rate.

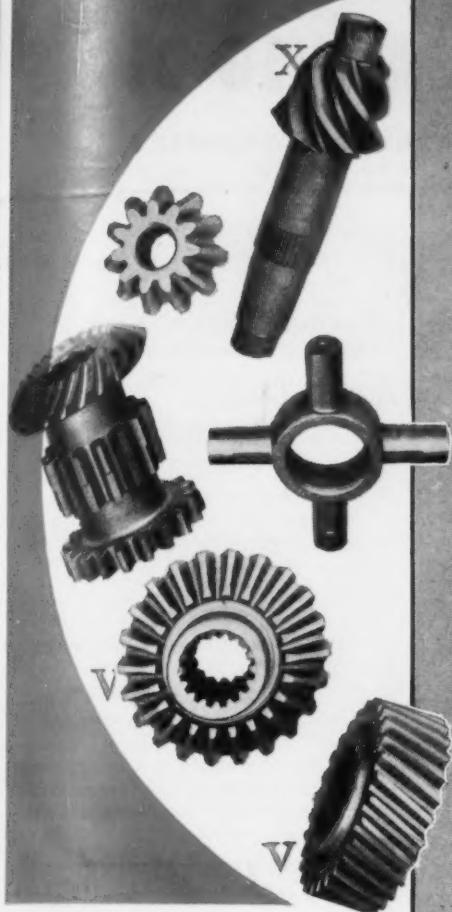
Why not investigate the advantages of V11 Bond Wheels by CARBORUNDUM in your cylindrical grinding operations? See your local CARBORUNDUM salesman or distributor—or write Dept. IA 81-27.



Only **CARBORUNDUM**
TRADE MARK

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company, Niagara Falls, N.Y.

*makes ALL Abrasive Products
...to give you the proper ONE*



XII

these parts
are cleaned in
 $\frac{1}{3}$ the time with

WHEELABRATOR® Airless Blast Cleaning Equipment

at the FAIRFIELD MANUFACTURING CO.
Lafayette, Indiana

VI



The high-speed cleaning of the Wheelabrator makes minutes do the work of hours to effect big savings for Fairfield.

A Wheelabrator Table replaced an airblast table at the Fairfield Manufacturing Company and now cleans the same quantity of work in $\frac{1}{3}$ rd the time. The airblast machine had been operated around the clock without being able to keep pace with production schedules. The Wheelabrator eliminated this production bottleneck by its high-speed removal of heat treat scale from the multitude of sizes and shapes of gears produced.

The Wheelabrator Table is equipped with special features enabling Fairfield either to clean or to shotpeen, according to customers' specifications, for increased fatigue life. A Wheelabrator Tumbler is also utilized for low-cost, high-speed removal of scale from forgings prior to machining.

Wheelabrator airless blast equipment is a big asset for any manufacturer. Its high-speed performance saves time and man-hours and cuts costs. Full particulars will be furnished without obligation. Write today for the complete story.

American

WHEELABRATOR & EQUIPMENT CORP.
510 S. Byrkit St. Mishawaka 3, Indiana

Wheelabrator®
AIRLESS BLAST
CLEANING

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST CLEANING EQUIPMENT


PENNSALT CHEMICALS

METAL CLEANING DIGEST

for men interested in Metal Cleaning Economies

U. S. STEEL REDUCES NUMBER OF BATHS, CUTS CLEANING COSTS ON GALVANIZING LINE

Early this year the Galvanizing Shop at the Irvin Works of the United States Steel Company faced a tough problem. They were asked to clean strip steel in their own tanks direct from the rolling mill, instead of having it pre-cleaned first on the tin mill's high-speed cleaning lines. This meant a new cleaning set-up ... unless a special product could be developed for this job.

Pennsalt was called in, and a three-way team went to work on the problem. The Pennsalt fieldman, Pennsalt's White-marsh Research Laboratories and men from the Irvin Works pooled their knowledge and set about developing a new cleaning procedure.

This wasn't easy, because the galvanizing shop cleaning tanks hadn't been designed to do a double cleaning job.

The first step, therefore, was to develop a special dual-purpose cleaner which would remove *two* types of soil.

Next the problem of cleaner strength was attacked. The new cleaner had to be strong enough to permit the use of the small capacity galvanizing line cleaning tanks, yet flexible enough to meet the multiple cleaning demands. Such a delicate ingredient balance could only be achieved by a *manufacturer* of basic chemicals, like Pennsalt.

Within one month from the date this unique cleaning problem came up, Pennsalt chemists made their recommendation and a test was arranged. They proved to be right on the very first try! Adherence tests proved conclusively that the cleaner was doing its job perfectly. In addition, the finished

product came out of the galvanizing shop with more "shine". Rejects due to faulty cleaning were nil. Cleaning costs were significantly reduced and the tin mill cleaning tanks were released for other service.

Zinc Die Castings Now Free of "Blisters"

Clean, plate, lacquer, bake ... that's the cycle used in making radio panels for two of America's leading automobile manufacturers. The panels are made from zinc-base die castings.

But the job platers had a tough time avoiding blisters after baking, caused by minute dirt particles or breaks on improperly cleaned parts.

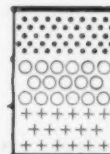
Then Pennsalt Cleaner Z-54 was tried. This cleaner is especially compounded for zinc-base die casting cleaning. Result—perfect, for all practical purposes. Average 0.1% cleaning rejects, and commendation from the automobile manufacturers for this highest quality work!

For Your Lab Notebook

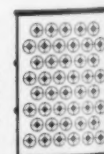
Why Pennsalt Alkaline Cleaners are Based on Fused Materials

Pennsalt alkalies for metal cleaners are prepared by an economical patented process that produces a *fused* homogeneous material. Fused alkalies will not segregate in drums—the alkali on the top of the drum is of the same balanced composition as the alkali at the bottom of the drum. Homogeneous composition also means fast, even dissolving of the alkali crystals—no rapid solution of caustic agents while phosphates or silicates drop to the tank bottom and dissolve slowly.

These fused alkalies are used as base materials for the various Pennsalt metal cleaners. Thus the user is assured of minimum alkali segregation, along with efficient, balanced bath composition. Pennsalt is a basic producer of metal cleaning alkalies—this means economies in manufacture which are passed on to the user.



This shows how the various ingredient particles of ordinary cleaners can shift and settle. (Exaggerated for clarity.)



Pennsalt Alkaline Cleaners are based on fused materials ... ingredients are fused into homogeneous particles, which remain uniform throughout the drum.



U. S. Steel and Pennsalt engineers observe results of new Pennsalt-developed cleaning process in galvanizing shop.

MAIL THIS COUPON

Please send more information on cleaning

(metal)

prior to (A)

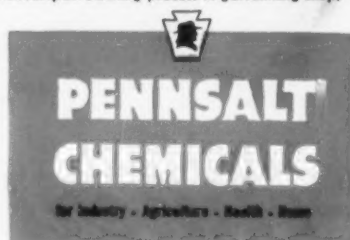
(Finishing method)

Name

Company

Address

City Zone State

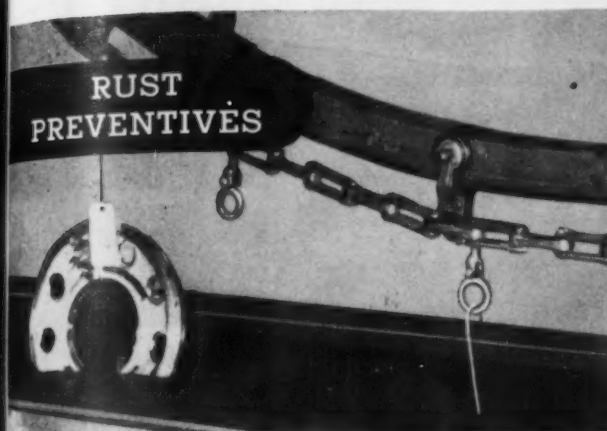


Progressive Chemistry for Over a Century

PENNSYLVANIA SALT MANUFACTURING CO.

WIDENER BUILDING • PHILADELPHIA 7, PA.

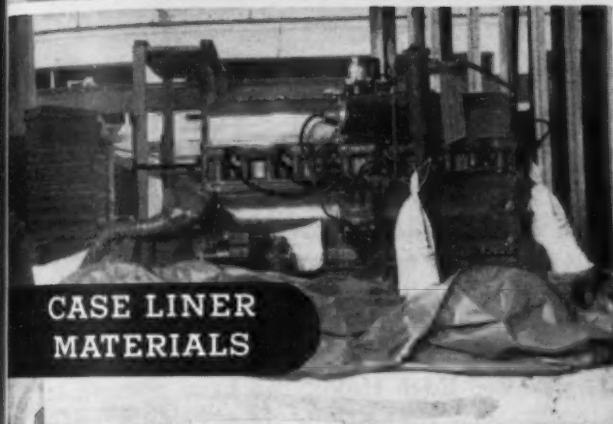
Progressive Chemistry for over a Century



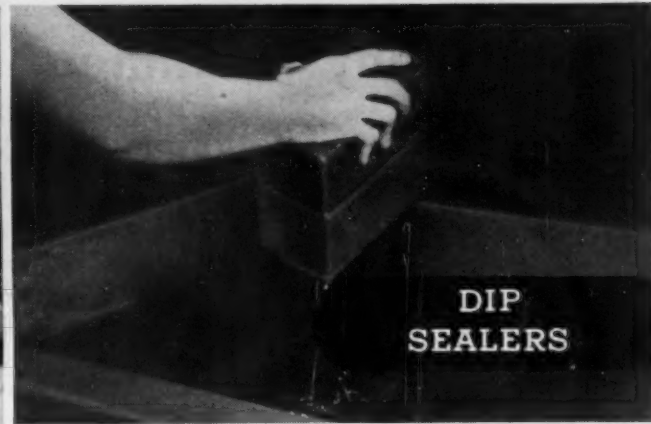
**RUST
PREVENTIVES**



**BARRIER
WRAPPERS**



**CASE LINER
MATERIALS**



**DIP
SEALERS**

Valuable information on how to package your government orders

Packaging machines and parts to government specifications calls for specialized experience and materials. In this vital step in completing a government order Dearborn can help you.

Dearborn stands ready to supply the government specified materials you will need. These include the rust preventives, wrappers and sealers for the widely known Method IA . . . case liners . . . fingerprint neutralizers. Other Dearborn materials include cleaners, rust removers and VPI, the specially treated paper that gives off an invisible protective vapor.

Why not discuss this important matter with a Dearborn packaging engineer? He will gladly assist you in setting up a packaging procedure that fully meets government specifications . . . one that will assure the corrosion-free arrival of your products at their destination.

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza • Chicago 54, Illinois

Dearborn
Reg. U.S. Pat. Off.

NO - OX - ID
IRON + OX = RUST

THE ORIGINAL RUST PREVENTIVE

This booklet will help you

The new edition of "Preventing Corrosion in Export Packaging" gives you: (1) current government specifications; (2) cleaning methods; (3) approved packaging methods; (4) how to apply rust preventives; (5) how to wrap, seal and dip parts; and (6) other valuable information with step-by-step picture stories. Write for it today.



Dearborn Chemical Company, Dept. IA
Merchandise Mart Plaza, Chicago 54, Ill.

- ☐ Please send a copy of "Preventing Corrosion."
☐ Have a Dearborn Representative call.

Name.....

Company.....

Title.....

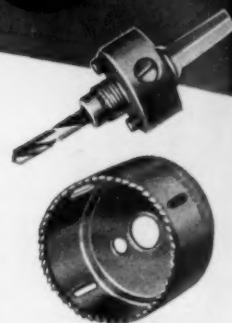
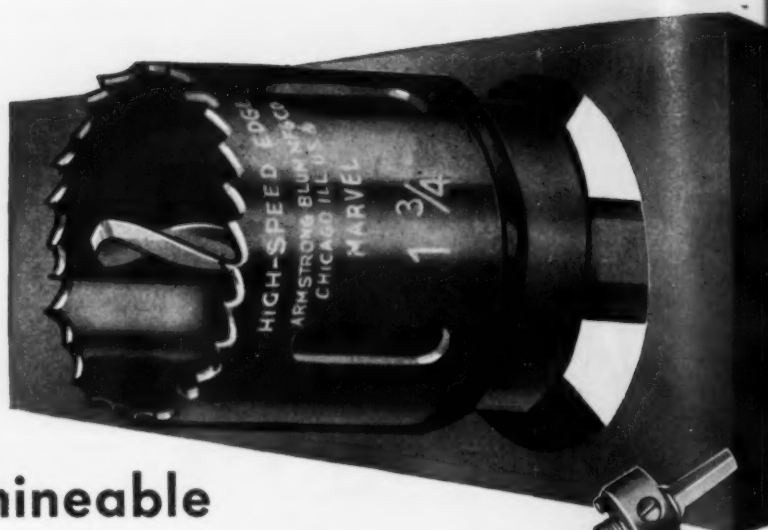
Address.....

City.....State.....

Cut...

LARGE HOLES

... thru any machineable material up to $1\frac{1}{8}$ INCHES thick!



Here is a premium tool which makes it possible to saw holes in one short operation ... large holes which heretofore had to be laboriously machined "a-chip-at-a-time."

MARVEL High-Speed-Edge Hole Saws have strength to withstand the terrific peripheral strains of heavy duty operation in lathes, drill presses or portable power tools. They have a high speed steel cutting edge which is electrically welded to a tough, alloy steel body, high speed steel pilot drills, heavy hexagonal shanked arbors and sufficient set for deep drilling. They are self-aligning, as the larger diameter saws float on their arbors and are driven by double drive pins. They will saw round holes accurately in any machineable material.

MARVEL High Speed-Edge Hole Saws come in 35 sizes, from $\frac{3}{8}$ " to $4\frac{1}{2}$ ". They are carried in stock by leading industrial distributors.

WRITE FOR BULLETIN ST-650



"MARVEL" has Always had the edge!

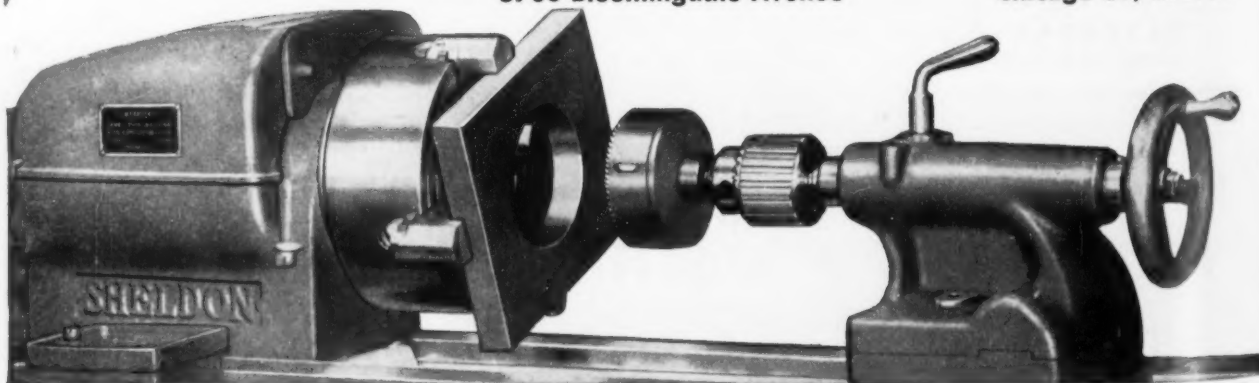


ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Avenue

Chicago 39, U. S. A.



Floor Space was a problem in this B.C.* plant

BC* (Before Cargotainers) inventory, parts and subassemblies were piled in every available nook and cranny in a chaotic wasteful and sometimes danger-

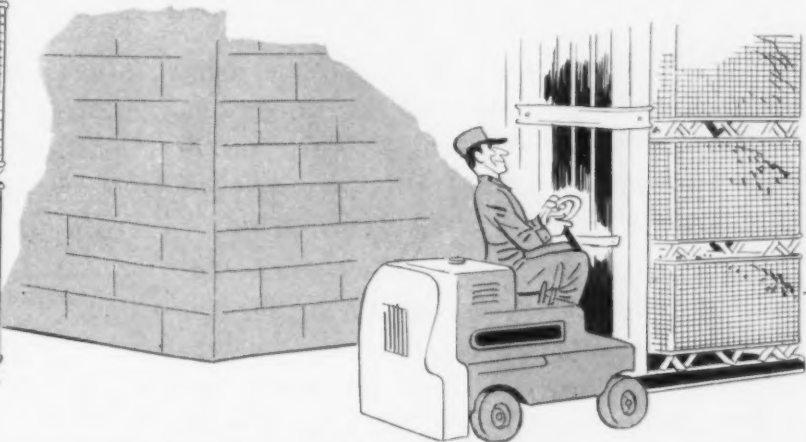
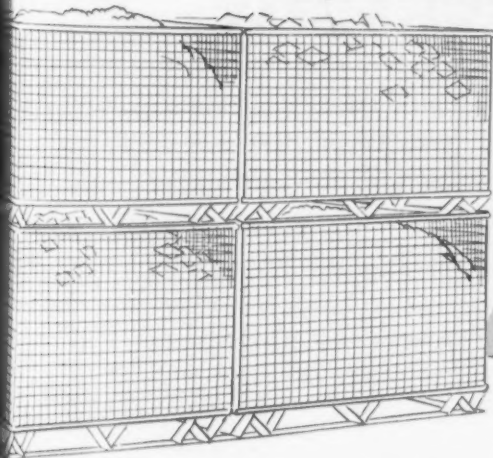
ous manner in this unfortunate plant. Costs went up and man-hours were lost until somebody finally saw the light. The terrible place looked something like this:



Then it went modern and A.C.*

When this plant joined the AC* (After Cargotainers) trend it started a new era of efficiency and profit. Smooth, safe, easy vertical storage took floor space off the critical list and actually made expansion possible without costly construction.

Everything became highly visible for quick inventory check—parts and assemblies remained right in their rugged collapsible Cargotainers as they moved to assembly line and shipment. This enlightened AC* plant now looks like this:



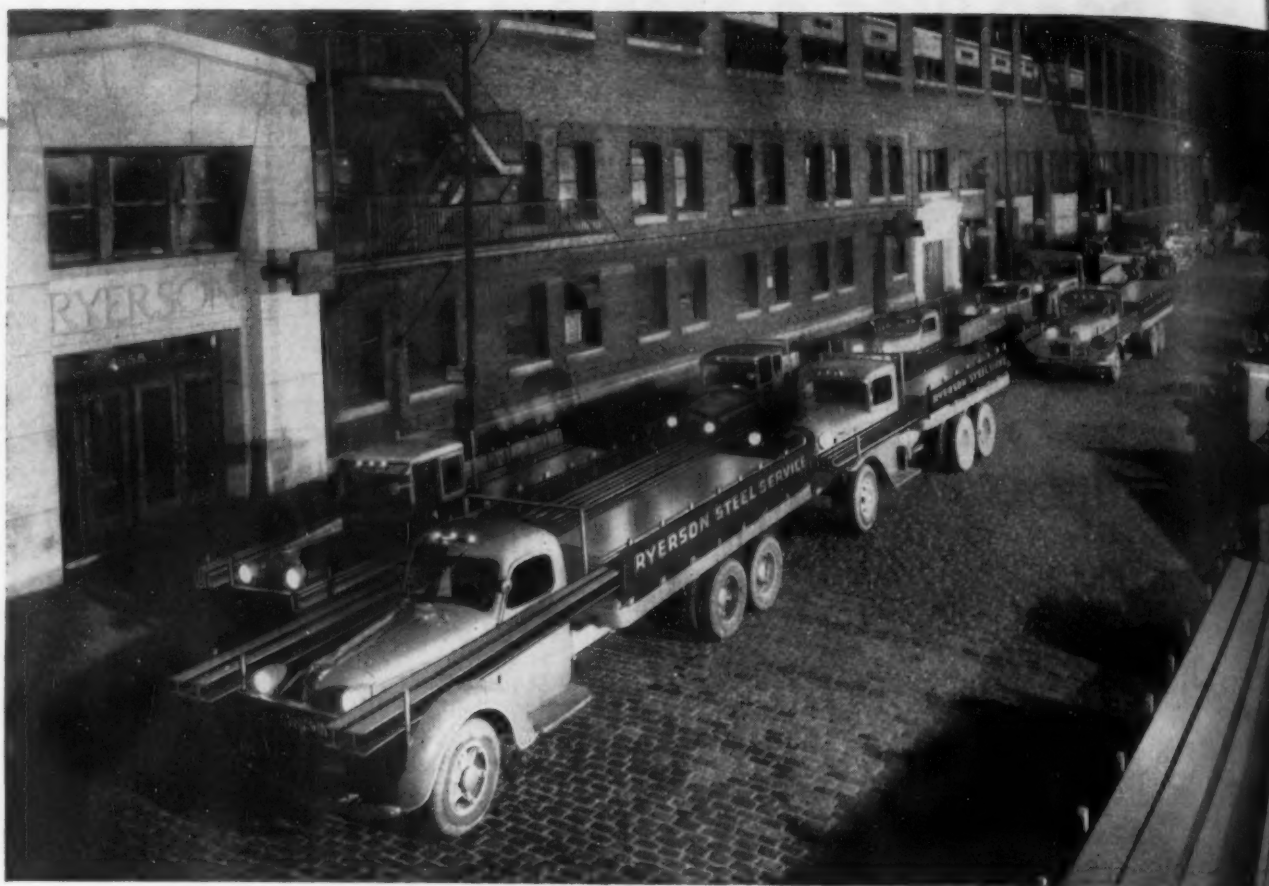
If by some chance, you are still BC why not let a Pittsburgh Materials-Handling Engineer show you how other plants have saved man-hours and storage space

and increased efficiency by joining the AC trend. Write today to Dept. FM, Pittsburgh Steel Products Company, Grant Building, Pittsburgh 30, Pa.

The Steel Industry
Needs Scrap—
Keep it Moving

CARGOTAINERS

by Pittsburgh Steel Products Company
A Subsidiary of Pittsburgh Steel Company



Working Late . . . To Ship Steel Early

Here are Ryerson trucks all loaded by the night shift and ready to be on their way to our customers—early in the morning. This “after-hours” operation is typical of the way we work at Ryerson to speed up your steel deliveries.

Every kind of steel is on hand for quick shipment at your nearby Ryerson Plant. Though stocks are currently out of balance due to ever-increasing defense needs and unprecedented civilian demand, we are still able to serve you.

Your Ryerson representative has specific answers to your questions involving the purchase,

application or fabrication of steel. He is fully posted, for instance, on the new alloys and on practical substitutes for hard-to-get steels. So, for any kind of steel—for complete steel service—call your nearest Ryerson Plant.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot and cold rolled, many types and coatings

TUBING—Seamless and welded,

mechanical and boiler tubes

ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel

STAINLESS—Stainless bars, plates, sheets, tubes, etc.

BABBITT—Five types, also Ryertex plastic bearings

MACHINERY & TOOLS—For metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND
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BIG REASONS

Why LYON Can Handle Your Sheet-Metal Subcontracts **BETTER!**

At Your Service
for Sheet Metal
Subcontracts

LYON METAL PRODUCTS, INCORPORATED

936 Monroe Avenue, Aurora, Illinois

Please send me a copy of LYON'S DEFENSE PRODUCTION BROCHURE which explains the 4 big reasons why Lyon can handle sheet metal subcontracts better.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

MAIL
COUPON FOR
THIS BROCHURE
•
IT TELLS ALL

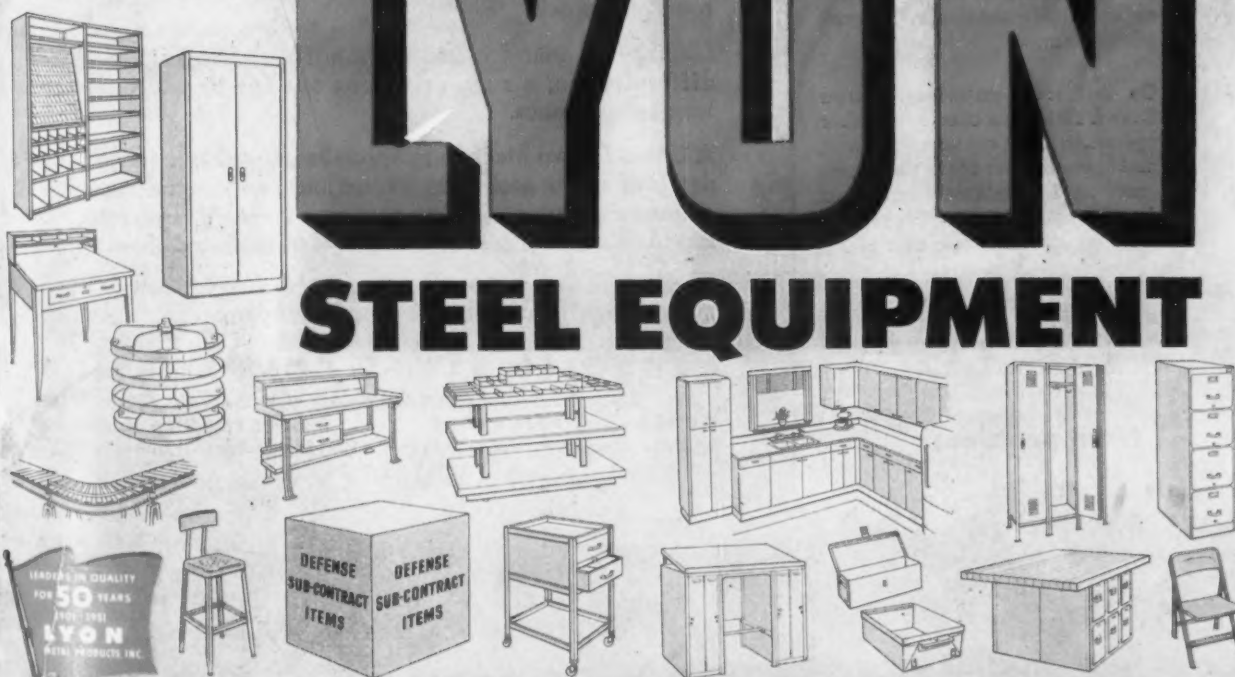
2 STRATEGIC PLANTS... AURORA, ILL., AND YORK, PA.

LYON METAL PRODUCTS, INCORPORATED

General Offices: 936 Monroe Avenue, Aurora, Illinois

LYON

STEEL EQUIPMENT

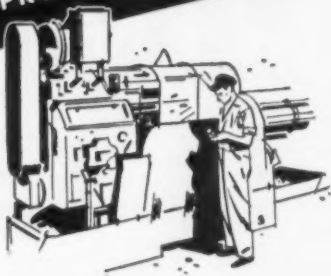


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- Shelving
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- Economy Locker Racks
- Flat Drawer Files
- Tool Room Equipment
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- Display Equipment
- Drawing Tables
- Revolving Bins
- Hanging Cabinets
- Filing Cabinets
- Folding Chairs
- Work Benches
- Bench Drawers
- Service Carts
- Sorting Files
- Drawer Units
- Hopper Bins
- Tool Stands
- Shop Boxes
- Tool Trays
- Shop Desks

How Republic Metallurgical Service

PROGRESS REPORT:



Jan. 26 Republic Field Service gets trouble call at 10 a.m.

Jan. 26 Union Drawn Machining Specialist contacts customer at 1 p.m. same day. Learns of difficulty in burnishing reamed hole, sketches suggested tool to give 5 to 10 micro-finish.

Feb. 2 Union Drawn Machining Specialist calls back to check tool drawings; makes corrections.

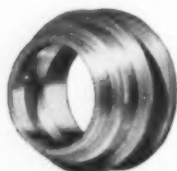
Feb. 23 Another call to check tool progress finds it almost completed.

Mar. 1 Union Drawn Machining Specialist checks alignment of burnishing tool on six-spindle automatic. Suggests set-up changes.

Mar. 8 On call from customer, Union Drawn Field Man checks burnisher operation; spots construction fault; makes on-the-spot correction. Parts come off as predicted — burnished finish is under 10 micro-inches. He stays on job until late that night.

Mar. 9 Union Drawn Man returns to see if any difficulty has occurred. Finds job running smoothly, with machine efficiency greatly increased.

from problem



to production—
6 WEEKS!

smoothed out a burnishing problem



● This Union Drawn Steel customer needed volume production of automatic transmission parts . . . needed it fast. Specifications called for a 40 to 60 micro-inch finish on a two-step internal bore, machined from Union Cold Drawn B-1113 2½" round bar stock.

Inability to hold the finish below 100 micro-inches caused difficulty. So, a rush call went out for Republic Metallurgical assistance.

A Union Drawn Machining Specialist looked over the job, and designed a new broaching fixture and head. According to the customer's latest report, "we are now running this job from 2 to 20 micro-inch finish . . . production has increased about 18%."

Need help on any steel machining problem of your own? You'll get it promptly from "MACHINABILITY Headquarters." Just write:

REPUBLIC STEEL CORPORATION

Union Drawn Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

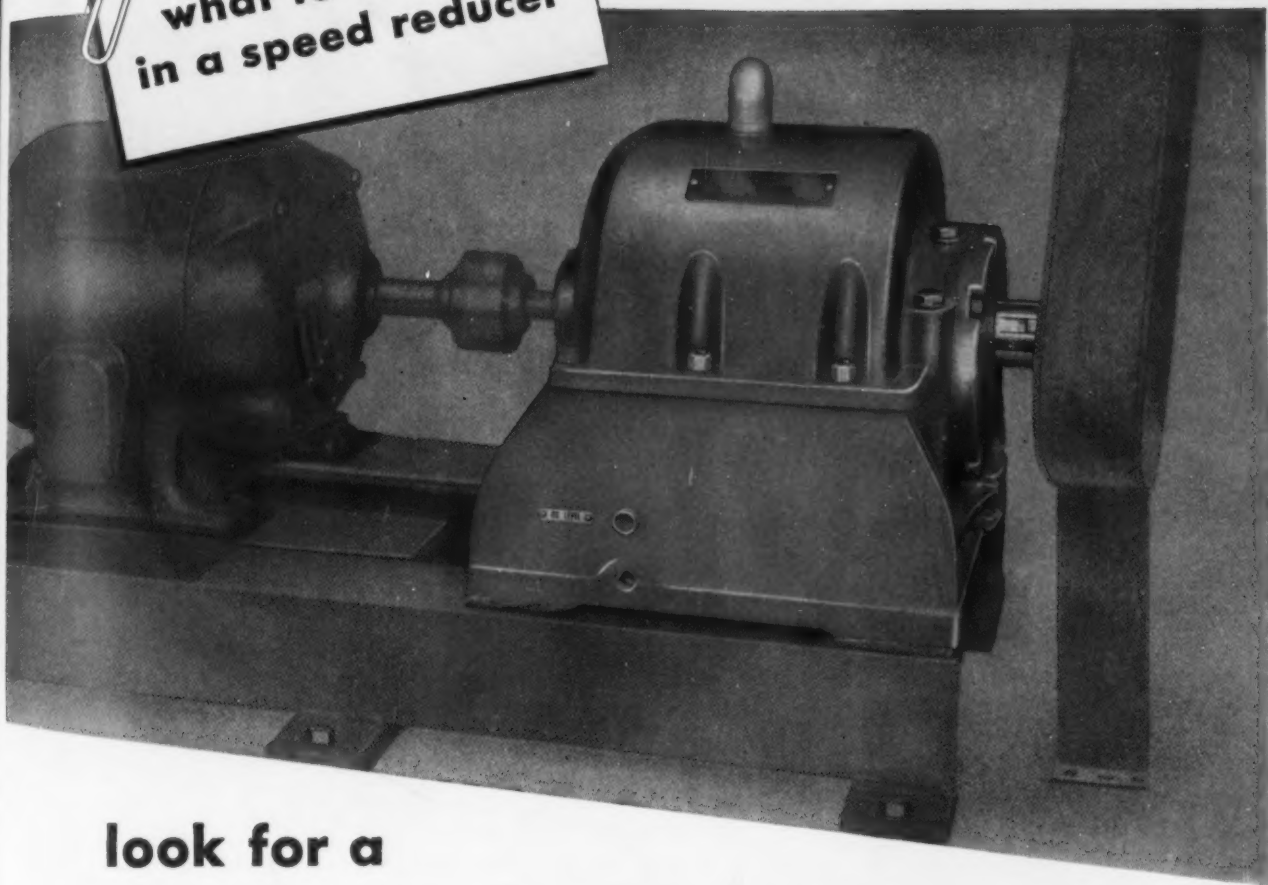
Export Department: Chrysler Building, New York 17, N. Y.

Republic UNION
COLD DRAWN STEELS



Free-Machining Bessemer, Alloy and Enduro Stainless Steels • • • Union Cold Drawn Special Sections
Union Cold Drawn and Ground Rounds; Turned and Polished Rounds; and Turned, Ground and Polished Rounds (Union Precision Shafting)

what to look for
in a speed reducer



look for a *Dependable Gear Assembly*

Tough, impact-resisting gears are the foundation for the dependable operation of Westinghouse Speed Reducers. Each gear is made from BPT Taper-Hardened Gear Steel, combining carefully selected material with an exclusive Westinghouse heat-treating process. Result is gearing with a hard, wear-resistant surface that tapers evenly to a tough, ductile core. Teeth will not chip, crack or spall.

Further dependability is provided by the accuracy of Westinghouse Gears. Teeth are cut by the hobbing process—recognized as the most accurate method of gear cutting. Tooth contours are precise and highly finished. Operation is smooth and quiet. The single helical design distributes load evenly, with uniform tooth deflection—large tooth contact area—long life with minimum wear.

You get such a dependable gear assembly in the new Westinghouse "DB" Speed Reducer pictured above.

This concentric shaft, split housing-type speed reducer fills the bill where floor space is limited. Construction permits straight-line mounting of speed reducer and prime mover.

There's a Westinghouse product to meet each of your gearing requirements — speed reducers, gearmotors, high-speed units, open gearing. Contact your Westinghouse representative for a copy of Descriptive Bulletin 3700-ISR. Or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania.

J-07302

YOU CAN BE SURE... IF IT'S
Westinghouse

GEARED DRIVES



Keep Your Scrap Moving

The obligation of steel manufacturers is to produce as much steel as possible within the limits of sound engineering and the over-all needs of economy. *You can help meet this obligation.* Scrap . . . will to the tune of millions of tons . . . will be needed to keep abreast of the present demand. Save your scrap and sell it as soon as possible to your local dealer.

Hot Rolled
Forged
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Heat Treated
Normalized
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Symbol of Quality in ELECTRIC FURNACE STEELS . . .



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STANDARD STRUCTURAL ALLOY
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MAGNAFLUX-AIRCRAFT QUALITY

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Out of this unique "forging laboratory" have come many significant advancements . . . the high speed forging press . . . modern horizontal Forging Machine . . . blank-preforming Reduceroil . . . Semi-Hot Rivet Header . . . Boltmaker . . . roll-over transfer Cold Nut Former . . . Automatic Precision Nut Tapper . . . Nail-Maker . . . Cold Headers for bearing rollers and balls, for tubular and solid rivets, and thousands of other parts . . .



In addition, we've been continually developing new forging applications and methods right along . . . establishing basic principles of die design as influenced by metal flow, both hot and cold . . . upsetting . . . deep piercing . . . extrusion . . .

Some of tomorrow's top developments in the forging field are now on our drawing boards and test floors!

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TIFFIN, OHIO.

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES—MAXIPRESSES—COLD HEADERS—AND BOLT, NUT, RIVET, AND WIRE NAIL MACHINERY


Hartford

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Famous
 FOR ACCURACY OF THREADS
 LOW COST CHASERS
 LESS DOWN TIME AND ALL AROUND
 DEPENDABILITY

FREE BULLETIN



THE EASTERN MACHINE SCREW CORP., 21-41 Barclay Street, New Haven, Conn.
 Pacific Coast Representative: A. C. Berhringer, 334 N. San Pedro St., Los Angeles, California. Canada: F. F. Barber Machinery Co., Toronto, Canada.

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OHIO LOCOMOTIVE CRANES
 25 TO 40 TON CAPACITY



GASOLINE • DIESEL
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LELAND-GIFFORD DRILLING MACHINES

- Individually Motored Spindles
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GET MORE PRODUCTION OUT OF YOUR PRESENT POWER PRESS EQUIPMENT



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Cutting Off Machines for Sawing All Kinds of Metals

THE ESPEN-LUCAS MACHINE WORKS
 FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

GOSS and DE LEEUW
 MULTIPLE SPINDLE CHUCKING MACHINES

Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
 GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

THE CLEVELAND CO.
STEEL TOOL

Punches, Dies, Chisels, Rivet Sets
 660 E. 82d St., Cleveland, O.
 If it's RIVETED you KNOW it's safe

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The Advertising Pages of

THE IRON AGE

for

New Production Ideas

- MACHINE TOOLS & TOOLING
- COMPONENT PARTS
- MATERIALS HANDLING
- PLANT SERVICE EQUIPMENT
- FASTENING & JOINING PRODUCTS

New Equipment

Continued



Parts cleaner

A new low cost bench type parts cleaner, the Brush-Flush, has handy fountain brush action. It features a hollow handle brush attached to the pump, with a tube, to produce a steady flow of clear solvent at the end of the bristles. Oil, grease and dirt are flushed away as they are loosened with the brush. *Graymills Corp.*

For more data insert No. 38 on postcard, p. 103



Check valve

The Bobrick pneumatic check valve operates at air pressures up to 4000 psi and hydraulic pressures up to 5000 psi. It is made of stainless steel. *Bobrick Mfg. Corp.*

For more data insert No. 39 on postcard, p. 103

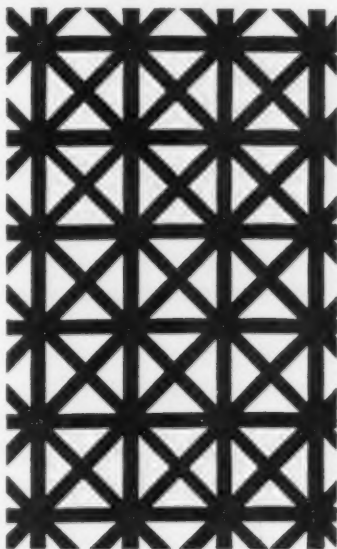
Hendrick Ornametal

TRADE MARK

This is a lightweight type of grille especially suited for radiator enclosures, stove panels, kitchen cabinets, clothes and broom closets, lockers, and similar applications. It is made of a special bright finish, cold rolled steel, suitable for painting or plating, and is available in a wide range of stock size sheets and gauges.

Hendrick Ornametal can be furnished in a variety of attractive designs, the one illustrated being "Smalcane." Write for full information.

1876—Seventy-Fifth Anniversary—1951



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Manufacturing Company

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities



Perforated Metals
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Milco Open Steel Flooring
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Precision Quality!

Immediate Shipment

GORDON THERMOCOUPLE EXTENSION LEAD WIRE

The precision quality of Gordon Thermocouple Extension Lead Wire is the result of continued experience since 1915 in careful selection and inspection that meets rigid insulation requirements and Bureau of Standards specifications.

Gordon's Chicago and Cleveland plants carry complete stocks of Thermocouple Extension Lead Wire for practically every application. (See illustrations below.) These are good reasons why your order gets immediate delivery of a QUALITY product. ORDER NOW! No delays. Prices available on request.



CHROMEL-ALUMEL, Cat. No. 1231(3-A), 14 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.



FOR PLATINUM THERMOCOUPLES, Cat. No. 1225, 16 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.



CHROMEL-ALUMEL, Cat. No. 1234, 14 ga., SOLID-DUPLEX, each wire enamel, felted asbestos, Asbestos-yarn braid overall.



IRON-CONSTANTAN, Cat. No. 1236-C, 14 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.



COPPER-CONSTANTAN, Cat. No. 1235-A, 14 ga., SOLID-DUPLEX, each wire cotton, rubber, weatherproof braid, lead sheath overall.



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Manufacturers & Distributors

Thermocouple Supplies • Industrial Furnaces & Ovens
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Dept. 16 • 2035 Hamilton Ave., Cleveland 14, Ohio

READY FOR PROMPT SHIPMENT C.F.&I. FLANGED and DISHED HEADS FROM STOCK



Partial view of stock and shipping department, showing some flanged and dished heads.

We can make prompt shipment from stock of standard and ASME type flanged and dished heads — 18" O.D. to 96" O.D.

For additional information write or wire Claymont Steel Corporation, Claymont, Delaware.

★ ★ ★

Large Diameter Steel Pipe...Carbon and Stainless-Clad Steel Plates



FLANGED AND DISHED HEADS

PRODUCT OF

CLAYMONT STEEL CORPORATION

SUBSIDIARY OF THE COLORADO FUEL AND IRON CORPORATION

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12"x10" I
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Crate M
BALER
Model 12-
Rise adj
BENDERS—
Series 100
16 Gauge
No. 500
100 ton B
Disc for
BENDING
1"x1/4" W
2"x1/4" Ho
2"x1/4" P
10" x 5/16
12"x3/4" C
18"x1/4" H
JOINT TH
2" Land
Bolted
MAKE-P
10" x 1/4"
Comple
A.C. M
12" x 3/16
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4000# B
for hand
gasoline
4000# B
handlin
reel—H
CRANES—
5 ton R
10 ton B
10 ton V
10 ton S
15 ton
15 ton
20 ton
50 ton
130 ton
CRANE—
Hughes
Gooeen
pneum
CRANE T
40 ton S
Gauge
CRANE—
Model 2
Compl
Ton 6
DRAW BE
240 ton
Two co
of 811
EYE BENE
William
4" B
FORGING
1 1/4" 3"
2" Ajax
1" 2"
FURNAC
35 KW
Tube
70 KW
Tube
200 KW
nace
Cham
Surface
For b
nace
FURNAC
Electric
5' w
Cham
200 KW
Cham
275 KW
Cham
FURNAC
400 lb
Char
Little
2 Ton
6 Ton
EVA
15 ton
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800 H
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THE CLEARING HOUSE

CONSIDER GOOD USED EQUIPMENT FIRST

ACCUMULATOR
Hose Hydraulic Air Ballasted Accumulator 50 GPM
@ 2000 Working Pressure

AIR COMPRESSORS
12" x 18" Ingersoll Rand Class EB-1, With 75 H.P.
Synch. Motor 2300/3/60, Complete with After
Cooler, Air Receiver, Etc.
12" x 14" Worthington Horla, with 300 H.P.
Cr. Wheeler Synch. Motor 4700/3/60 & Starter
12" x 14" Worthington, With 2300 Volt 60
Cycle Motor and all operating equipment

ROLLER
Model 15-P Logemann Roller, Box 82"x19"x24", Bale
Size approx. 12"x11"x18"

BENDERS—PIPE
Series 100 Pipe Bending Machine, Capacity, 1" O.D.
18 Gauge Tubing
No. 40 Wallace Bending Machines, Capacity 1 1/2"
100 ton Baldwin Southwark Hydraulic Pipe Bender,
Dies for bending pipe 2 1/2" to 3" incl.

BENDING ROLLS
1 1/2" Webb Model B-3-L Initial Type, M.D.
1 1/2" Hendley & Whitmore Initial Type, Motor Drive
1 1/2" Pyramid Type Plate Bending Roll, M.D.
1 1/2" x 1/4" Bertch Initial Type, Motor Driven
1 1/2" x 1/4" Cleveland Pyramid Type, Motor Driven
1 1/2" x 1/4" H & J Pyramid Type, Motor Driven

ROLL THREADING MACHINE
1" Landis Single Head Bolt Threading Machine,
Bolted Motor Drive, Key Bolt with Lead Screw

MAKE—PRESS TYPE
10" x 1/4" Cincinnati Series 90 All Steel Press Brake
Complete with all standard equipment & 15 H.P.
A.C. Motor—NEW 1948
17" x 2 1/2" Drels & Krump, Motor Driven

CHARGING MACHINES
4000# Brusilux Floor Type, Gasoline Driven, Peel
for handling O.H. Charging Box, Rubber tired Buda
gasoline engine
4000# Brusilux Floor Type, Motor Driven, Peel for
handling O.H. Charging Box, Equipped with cable
reel—Both NEW 1948

CRANES—OVERHEAD ELECTRIC TRAVELING
1 ton Robbins Myers 25'6" Span 230 Volt DC,
19 ton P & H 80' Span 230 Volt DC,
With 3 Ton Auxiliary Hoist
10 ton Milwaukee 48' 230 Volt DC,
15 ton Niles 60' Span 230 Volt DC,
15 ton OET 46' Span 220/3/60
20 ton Morgan 37'0" Span 230 Volt DC,
35 ton Northern 53' Span 440/25/3 AC,
With 10 ton Auxiliary Hoist
130 ton Whiting 79' Span 230/3/60
With 10 ton Auxiliary Hoist

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Hughes Keenan Rouabout Crane Model MC-4 35 ft.
Gooseneck Boom, Mounted on Tractor Equipped with
pneumatic tires

CRANE TROLLEY
40 ton Shaw-Hut Trolley, With 15 H.P. G.E. Motor
Gauge of Trolley 7'6", Lift 80' NEW 1948

CRANE—GANTRY
Model 200 Colby Electric Powered Whirley Crane,
Complete with elec. equip, 440/3/60, Capacity 45
Ton @ 20' Radius to 10 Ton @ 50' Radius

DRAW BENCH
40 ton Clearing Machine Co., Hydraulic Draw Bench
Two column Type with Double Action Piston, Stroke
of 81/2" 200"

EYE BENDER
William White, Capacity 1 1/2" Round stock bent hot,
1/2" Round stock bent cold

FORGING MACHINES
1 1/2", 3", 3", 4", 5" Ajax
5" Ajax, Motor Driven—Air Clutch—New 1941
1", 2", 3", 4" Anene

FURNACES—ANNEALING
35 KW Electric Wire Annealing Furnace Continuous
Tube Type Muffs 5' 11" Long, Cooler 4'3" Long
70 KW Electric Wire Annealing Furnace Continuous
Tube Type 9' 5 1/2" Long with Cooler 9' Long
200 KW Continuous Electric Bright Annealing Fur-
nace Heating Chamber 4'6" x 30' Long, Cooling
Chamber 44' Long in two parts
Surface Combustion Radiant Tube Annealing Furnace,
For bright annealing copper tubing, Hearth-heating
area 30' long 3' wide
53' Span 440/25/3 AC

FURNACES—HEAT TREATING
Electric Furnace Co. Rotary Furnace Hearth 31' Dia.,
5' wide, Sq. Ft. Hearth Area 438
Chamber 20' Long, Cooling Chamber 18' Long
200 KW Westinghouse Roller Hearth Furnace Heating
Chamber 30' Long, Cooling Chamber 18' Long
215 KW Westinghouse Roller Hearth Furnace Heating
Chamber 12' Inside Length, 54' Inside Width

FURNACES—MELTING
400 lb. Moore Type "UT" Melting Furnace, Top
Charge, Complete with Transformer, New 1943—
Little Used
2 Ton Heroult Nose Tilt Type Melting Furnace
5 Ton Heroult Tilt Type Melting Furnace, With 2000
KVA Westinghouse Transformer, 11,000/3/60
15 ton Heroult Model V-12, Top Charge Hydraulically
Operated, Complete with Transformer Equip.

GEAR REDUCERS
800 H.P. Falk Single Herringbone Reducer Ratio
2:15:1
1200 H.P. Mesta Double Reduction Gear, Ratio 20.52:1
800 H.P. Westinghouse Reduction Unit Ratio 2:76:1
800 H.P. Falk Single Herringbone Gear Reducer
300/40 RPM

GRINDER
No. 72 Hanchett Vertical Surface Grinder, Three
Spindle, 72" Rotary Table, With Electrical Equip.

HAMMERS—BOARD DROP

1200, 1600, 2000 lb. Chambersburg
1000, 3000 lb. Billings & Spencer
3000 lb. Erie

HAMMER—ROPE DROP

42" x 62" 3 ton Rope Drop Hammer, Incl. two 15
H.P. A.C. Motors

HAMMERS—STEAM DROP

1000 lb. Chambersburg
1500, 2000 lb. Erie

HAMMERS—STEAM FORGING

1200 lb. Massillon Single Frame
1500, 1600, 2000, 3000, 4000, 5000, 6000, 8000 lb.
Chambersburg
600, 1500, 2500, 5000 lb. N.B.P.
600, 1100, 1500, 2000, 2500, 3500, 12,000 lb. Erie

HAMMERS—MISCELLANEOUS

No. 2B Nazel Hammer, Motor Driven
No. 6N Nazel Hammer, Geared Motor Drive
500 lb. Baudry Hammer, Motor Driven

KEYSEATER

No. 6 Giant Vertical Keyseater, M.D.

LATHE

36" x 17' Bridgeford Geared Head Lathe Quick Change
Gear, Motor Driven

LATHE—TURRET

Gisholt Model 2L Turret Lathe, Motor Driven, 15" Dia.
3 Jaw Universal Chuck, 4" Hole in spindle, NEW
1943 or later

LEVELER—STRETCHER

Model 1196 Torrington Hydraulic Stretching Machine
Capacity Sheets 14' long x 5' wide, Complete with
Pump and Motor

MOTOR

750 H.P. G. E. Syn. Motor, 2300/3/60, 450 RPM.
Used only 3 years

MOTOR GENERATOR SETS

1000 KW Westinghouse Generator 250 Volt D.C. with
1440 H.P. Westinghouse Synchronous Motor 2300
volt 25 cycle 3 phase
1800 KW General Electric Generator 250 Volt D.C.
With 2500 H.P. G.E. Motor 2300/3/60

RAIL MAKING MACHINES

No. 1 1/4 National—Sizes 10D, 12D, 16D, 20D, 30D
No. 3 National—Size 6D
No. 2 Glader Sizes 6D, 7D, 8D, 9D
Angel Sizes 10D, 12D, 16D, roofing

PLANERS

32x25"x10" Niles One Rail Head
48x48"x18" Cincinnati, Four Head
48x48"x12" Niles-Bement-Pond, Four Head
60x60"x12" Niles-Bement-Pond, Four Head
72x72"x16" Detrick & Harvey, Four Head, M.D.
72x72"x24" Betts, Four Head, M.D.
120x72"x19" Betts, Four Head, M.D.

PLANERS—OPEN SIDE

60x60"x16" Detrick & Harvey, Three Head
60x60"x18" Detrick & Harvey, Three Head

WE OFFER A COMPLETE LIQUIDATION
SERVICE ON ANY BASIS WHICH
CIRCUMSTANCES INDICATE WOULD
BE MOST BENEFICIAL, WHETHER BY
AUCTION, PRIVATE LIQUIDATION
OR OUTRIGHT SALE
CONSULTANTS IN
MANUFACTURING PROBLEMS
FOR OVER A QUARTER
OF A CENTURY
THERE IS NO SUBSTITUTE
FOR EXPERIENCE
CONTACT US IN CONFIDENCE
WITHOUT COST OR
OBLIGATION

PRESS—EMBOSSEING & COINING

Bliss #26-A 800 ton Double Geared Knuckle Joint
Press, With 8 Station Dial Feed

PRESSES—HYDRAULIC

75 ton Williams White Straightening Press, 27"
Stroke, Bed 8' x 16", 6 1/2" Dia. Ram
150 ton Elmes Double Action Hydr. Press 20" Stroke
of Blankholder, 32" Stroke of Punch Slide, 36" x
37" Bed Area
200 ton Bliss Hydrodynamic, 48" Stroke, Bed Area
24" x 24", Hydr. Pump Incl.
500 ton Southwark Open Throat Hydraulic Press, 12"
Stroke, Platen 56" x 56"
1000 ton United Steam Hydraulic Forging Press Quick
Acting, Stroke 48", Distance between columns FtOB
31" Riol 72", With 8000 lb. Alliance Straight
Line Manipulator
1500 ton Mesta Steam Hydraulic Forging Press, 48"
Stroke, 8' x 3'6" Between Columns—Including
Wellman Manipulator Rotating Type

PRESS—HYDRAULIC WHEEL

100 ton Caldwell Hydr. Wheel Press, 36" Between
Parallel bars

PRESSES—STRAIGHT SIDE

No. 620 Bliss High Production Press Flywheel Type
1 1/2" Stroke, Face of Slide 8' x 16 1/2"
525 ton Cleveland Double Crank, Double Geared
20"x120" Bed Area, 24" Stroke, Three 50 ton
cushions, Air Clutch, Elec. Equipment

No. 675B Bliss Single Geared, 1 1/2" Stroke, Double
Roll Feed & Chopper, 10 H.P. A.C. Motor

PRESS—TOGGLE DRAWING

No. 14B Bliss Toggle Drawing Press, 53" Between
Uprights, 24" Stroke of Blankholder, 23" Stroke of
Plunger

No. 168 1/2 Toledo 200 ton Capacity, Area of Ram
39"x48", Inner Stroke 17", Outer Stroke 12"

PRESSES—TRIMMING

No. 3 Erie Flywheel Drive Trimming Press, 3 1/2"
Stroke, 13" Between Guides
100 ton Chambersburg Hydraulic Trimming Press 18"
Stroke, 36" Between Uprights
No. 306 1/2 Bliss, 3" Stroke—New 1943, Equipped with
Side Shear

No. 16 Erie Geared 350 ton Trimming Press 6" Stroke,
24" x 36" Bed Area

PUNCH—BEAM

Long & Allstatter Double End Beam Punch, Capacity
Beam Punch End—Punch flanges and web 24" I-
beam and smaller

PUNCH & SHEAR COMBINATIONS

No. 1/2 Buffalo Universal Ironworker, M.D. Capacity
Rounds 1 1/2", Sq. 1 1/2", Angles 3 1/2"x 1/2" Punch 1"
thru 1/2"

No. 4 1/2 Hilles & Jones Single End Punch, 60" Throat
Capacity 1 1/2" thru 1", Architectural Jaw
No. 4 Hilles & Jones Single End Punch, 48" Throat
Capacity Punch 1 1/2" thru 1"

ROLLING MILLS

10" Breakdown Mill Single Stand (Three High)
8" Finishing Mill Five Stand (Three High)
Complete with accessory equipment
9 x 20" Schmitts Single Stand Two High
12"x24" Waterbury Farrel Two Stand Two High
20" x 36" Poole Two Stand Two High
20" x 60" Mackintosh Hemphill 3-Hi Breakdown Mill
22" x 40" Continuous Single Stand Two High

ROLLS—PLATE STRAIGHTENING

51" Plate Straightening Roll, 7 Rolls 10" Dia.
84" Bertch Plate Straightening Roll, 7 Rolls, 13" Dia.

SAWS

No. 749 Espen-Lucas Heavy Duty Cold Saw, Complete
with Oil Feed and Elec. Equip. Capacity with 34"
Dia. Saw Blade 48" x 7"
62" Newton Type U-37-B Hydraulic Cold Saw 62"
Dia. Blade, Capacity 20" Round, 18 1/2" Square,
Complete with Elec. Equip.

SHAPER

No. 18 Fellows Gear Shaper, Including Variable speed
gears, work holding arbors, head plates with spacers,
work holding cradle, shaving cutters, etc. NEW
1944, never used

SHEARS—ANGLE

Long & Allstatter Double Angle Shear, Model B,
Capacity 60x1 1/2", Complete with Elec. Equip.
No. 5 Cleveland Double Angle Shear 8x21" Mounted
on Turntable, Geared Motor Drive

SHEARS—BAR

No. 2 LH Lewis Open End Bar Shear, Motor Drive,
Capacity 1 1/2" Round
No. 9 Buffalo Bar Shear, Motor Driven, Capacity
Round 3 1/2", Sq. 3", Flats 7x1", etc.

SHEAR—GATE

60" x 1" Bertch, Motor Driven, 30" Throat

SHEARS—ROTARY

No. 40A Quickwork Rotary Shear, 1/2" Capacity Circle
Cutting Attachment & Elec. Equipment Included
No. 60 Quickwork Rotary Shear, 1/2" Capacity
No. 100 Kling Rotary Shear, 1" Capacity

SHEAR—SQUARING

6' x 1 1/2" Cincinnati, Hydraulic Holddown
12' x 3/16" Niagara #8144 Overhead Drive Micrometer
back gauges
36" x 1/2" Drels & Krump, Motor Driven, 18" Throat
Depth

SLITTERS

48" Paxson Sheet Slitter, Arr. M.D., Cap. 15 cuts .000"
72" Yoder Gang Slitter, Capacity 5 Cuts 20 Ga.

STRAIGHTENERS

Sutton Single Cross Roll Straightener, Motor Driven,
Capacity 1/2" to 1 1/2" Tubes or Bars, Timken Roller
Bear., Complete with Pump and Motors
No. 1 Sutton, Capacity up to 1 1/2" Diameter
No. 2 Sutton, Capacity 1 1/2" to 3 1/2" Round

SWAGING MACHINES

No. 2A Standard, Capacity 1/2" Solid 1 1/2" Tube
No. E4 Langeller, Capacity 1 1/2" Tubing
No. 408 Etna Swager, Capacity 4" Tubing, Length
of Dies 8"

TESTING MACHINES

10,000# Olsen Universal Wire Testing Machine
20,000# Southwark Model 810C Hydr. Universal
50,000# Riehle Universal Testing Machine
120,000# Baldwin-Tate-Emery Universal Hydr.
200,000# Riehle Universal Testing Machine
300,000# Southwark Emers Universal Hydraulic

TRANSFORMERS

1500 KVA Westinghouse Transformer, 66,000 volt 60
cy. primary, 480 volt secondary
1800 KVA Westinghouse Transformer, 13,800 volt
60 cy. primary, 230 volt secondary
7600 KVA General Electric 33,000 to 13,800 volts, 3
phase, 60 cycle

WELDERS

150 KVA Federal P2-12A Press Type Spot Welder
440 volt single phase 60 cycle
Taylor Winfield Press Type Spot Welder, Type
EWRD-36-3 HI-WAVE
70 KVA Federal Flash Welder, Enclosed Rim Type
Ring Size 6" to 35" Dia. x 12" Wide, 440 Volts
Single Phase
200 KVA Selsky Type PMM-1C-200-30 Circular Seam
Welder, 440 volt 60 cycle single ph.

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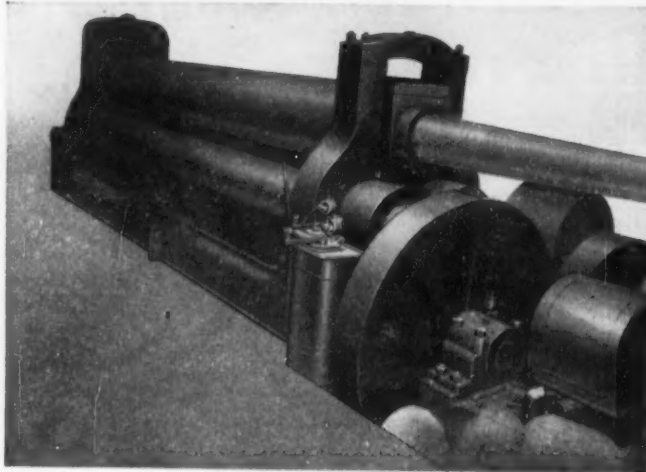
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Telephone Cortlandt 7-3437

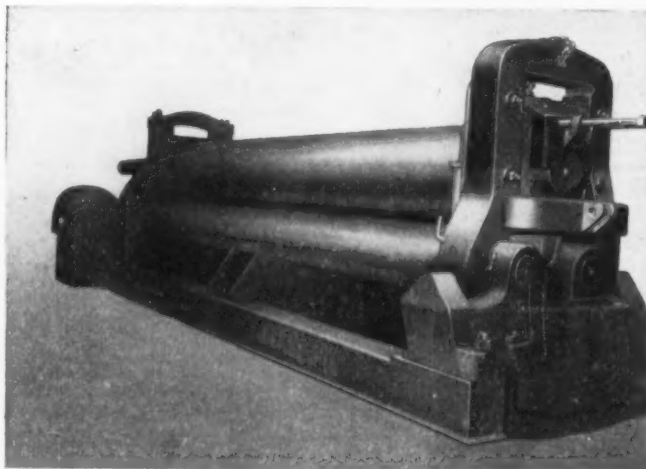
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BENDING ROLL



#7 Southwark Horizontal pyramid type
Capacity 20' of 1 1/4" plate
Diameter top roll 30"
Diameter bottom rolls 20"



EXCELLENT CONDITION
Completely motorized — fully equipped

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WOodward 1-1894

16-Y-28 Bryant Internal Grinder
#4 L M S Leland-Gifford Single Spindle Drill
& D Potter & Johnston Automatic Chucking Machine
#35 Excello Thread Grinder
#61A Fellows Gear Shaper
#1A Warner & Swasey Turret Lathe
#30 Waterbury Farrel Thread Rollers
#20 Brown & Sharpe Automatic Screw Machine with Turner Drives
#3 Barber Coleman Hobbing Machine
G1-A Acme Gridley 1 1/2" Automatic Screw Machine
#262 Barnes Camel Back Drill
4' 11" American Radial Drill
3' 9" Cincinnati Bickford Radial Drill

Hazard Brownell Machine Tools, Inc.
350 Waterman St., Providence 6, R. I.

COMPRESSORS—VACUUM PUMPS
STATIONARY—PORTABLE
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MILES' QUALITY

AUTOMATIC, 5/8" New Britain 6 spdl.
AUTOMATIC, 1 1/2" Cone 4 spindle
AUTOMATIC, No. 454 New Britain Chucking
AUTOMATIC, 14" x 19" Fay
BORING MILL, 2 1/2" Cleveland horiz.
BORING MILL, 4" Detrick Harvey floor
BORING MILL, 84" Gisholt vertical
BROACH, No. 1 Foote Burt twin surface
BROACH, 2 ton American hor. hydr.
BULLDOZER, No. 22 Williams & White
DRILLS, Nos. 121, 217, 310, 315 & 321 Baker
DRILLS, 20" & 24" Barnes camel back
DRILL, 24" Cincinnati Bickford
DRILL, 16 spdl. No. 13 Natco
DRILL, 12 spdl. No. 10 Defiance rail
DRILL, 3' & 6' Drees radial
DRILL, 1 & 4 spdl. Avey hydr. feed
GEAR HOBBER, 8H, 12H, 16H, 18H G. & E.
GEAR HOBBER, No. 130 Cleveland
GEAR HOBBER, No. 12 Barber Colman
GEAR HOBBER, No. 1 Lees Bradner
GEAR SHAPER, Nos. 6 & 7125A Fellows
GEAR SHAVER, 8"-12", Red Ring
GRINDER, CENTERLESS, No. 2 Cincinnati
GRINDER, CYLINDER, 10 x 18 Landis
GRINDER, INTERNAL, Nos. 16-28, 16F28 & 24-36 Bryant
GRINDER, INTERNAL, Nos. 72A3 & 72A5 Heald
GRINDER, SURFACE, No. 16A2 & 10 Blanchard
GRINDER, SURFACE, 12" & 16" Heald No. 22
GRINDER, SURFACE, 14" x 48", No. 5 Abrasive
GRINDER, THREAD, No. 33 Excello
GRINDER, UNIVERSAL, 14" x 36" Landis
HAMMER, No. 5N Hazel pneumatic
HAMMER, 40 lb. Bradley heave
KEYSEATER, Nos. 4 & 5 Mitts & Merrill
LATHE, 36" x 16" Bridgeford, GH, QCG
LATHE, 26" x 15" Wickes, GH, QCG
LATHE, TURRET, 4 1/2" No. 3A Warner & Swasey
LATHE, TURRET, Nos. 3 & 7 B. & O. Cone, motorized
MILLER, Nos. 2A & 2AS Milwaukee
MILLER, No. 2 Cincinnati, plain & vert.
MILLER, No. 4-36 Cincinnati, Hydromatic
MILLER, Nos. 1, 2 & 3 Kent Owens hand
MILLER, Nos. 1-8 & 1-14 Kent-Owens hydraulic
MILLER, 18" & 24" Cincinnati duplex
MILLER, 26" x 24" x 14" Ingersoll, planer type
MILLER, 48" x 21" x 22" Ingersoll, planer type
MILLER, THREAD, Type C Hall planetary
MILLER, THREAD, Nos. 4, 6 & 36 CT Lees Bradner
MILLER, Type 45 Productomatic
MILLER, 30", 42" & 84" Ingersoll rotary
PLANNER, 36" x 36" x 8" Gray, 3 heads
PLANNER, 36" x 36" x 10" Betts, 4 heads
PLANNER, 48" x 48" x 14" Woodward, 4 heads
PRESS, No. 304 Bliss straight side
PRESS, Nos. 245 1/2 & 279 Hamilton S.S.
PRESS, No. 77 1/2 Bliss S.S. trimming
PRESS, 650 ton No. 570 Toledo forging
PRESS, 32 tons No. 61 Cleveland OBI
PRESS, 45 ton No. 73 Consol. O.B.I.
PRESS, Nos. P1, P2, P3 & P5 Ferracute
PRESS, 100 ton HPM hydraulic
PRESS, CA4 Ferracute adjustable knee
PRESS, 150 ton Model EG-52 Ferracute
PRESS, 1000 ton Bliss No. 27 knuckle-joint coining
800 ton No. 665 Toledo coining
400 ton No. EG54 Ferracute coining
Nos. 245 1/2 & 279 Hamilton SS
No. 77 1/2 Bliss S.S. trimming
PUMPS, Four Vickers hydraulic
RIVETERS, No. 5A Grant pedestal-type hammer
REAMERS, Three Houda specials
SLOTTER, 16" Bement Miles crank
SAWS, Two No. 8165 Kalamazoo metal-cutting band
SAW, 36" Tannewitz metal-cutting band
SAWS, 4", 7", and 8" Nos. 12, 14, and 17 Higley cold-cutting
SHAPERS, 34" and 27" Morton traw cut
SHAPERS, Two 24" Queen City
SHEAR, 38" throat New Doty No. 17F
TAPPER, 14-spindle Natco No. E5 vertical
TAPPERS, Two No. 71 Ettco
TAPPERS, Two Greenlee 3-way special
TAPPER, No. 2 Garvin
THREADER, 2" Landis pipe threading and cutting
THREADERS, Two 3/4" Landis, double-spindle
THREADER, 2" Oster Rotary head
UPSETTER, 2" National, steel frame
UPSETTERS, Two 4" Ajax heavy duty twin gear
WELDER, 200 KVA Federal flash butt
WELDER, 100 KVA Thompson automatic spot
WELDER, 25 KVA Federal spot, 20" reach
WELDERS, 12", 14", and 16" 12 and 18 KVA Amer. Elec. Fusion Co. spot.

MILES MACHINERY CO.
BOX 770
SAGINAW, MICHIGAN

THE CLEARING HOUSE

AARON HAS A TREMENDOUS STOCK ALL FOR IMMEDIATE DELIVERY

BORING MILLS

Bullard 24", VTL. New Era (2)
Cleveland 2 1/2" Bar Cap.
Giddings & Lewis No. 0, 3" cap.
Giddings & Lewis No. 32, 3 1/2" cap.
King 42" Vert. 2 rail heads
Niles-Bement-Pond 4", 4 1/2" Bar
Niles-Bement-Pond 60" Vert.

DRILLS AND RADIALS

American 6' x 15" Col. Univ.
Baush Radial Drill & Tapper
Bausch 15 Spindle
Buffalo #2 Motor Spindle
Cincinnati-Bickford 6' x 13" Col.
Excelsior 21" B.G., New & Used
Leland Gifford 2 LMS

ENGRAVERS

Auto Engravers Bench
Deckel Type GK2 New (6)
Gorton ME, 1A 2 Dimensional
Gorton #3B, 3 Dimensional
Gorton 1D, 2 Dimensional

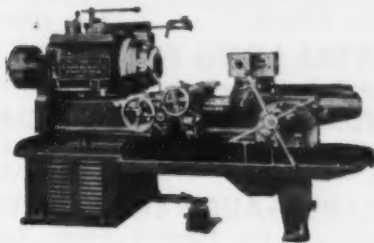
GEAR EQUIPMENT

Barber-Colman #3 Hobber
Barber-Colman #12 Hobber (2)
Fellows High Speed Shapers 712, 72, 725
Fellows #20M Red Liner
Fletcher 72" Cutter
Gleason 3" Straight Bevel Generator
Gleason #4 Angular Bevel Tester
Gleason #2 Surface Hardener
Gleason 15" Bevel Gear Rougher
Gould & Eberhardt 36" Cutter
National Broach Red Ring Lapper
Schuehardt & Schutte #1 Hobber

GRINDERS, MISCELLANEOUS

Bryant #5, Internal Chucking
Cinn. #2 Centerless
Covel 91A Univ. Tool & Cutter
Grenby Int. IG-12, G-2
Heald 81 Gagematic Internal
Heald 72A3 Int. Centerless Sizermatic,
#1 Tool
Heald 73 Internal Centerless
Landis 6" x 30" Type C Cyl. 12 x 36"
Univ., Raceway #1
Majestic Internal
Norton 6" x 18", 6 x 30" Type C cyl. 10
x 18, Buraway
Oliver #510 Drill Pointer, Setters 4G,
6G
Porter Cable Belt WG8
Pratt & Whitney Radius #R6, K.O.
Lee Tool
Sterling Tool & Cutter
Van Norman #666 Crankshaft
Vernon, Tool & Cutter

DENVER 6-2 TURRET LATHE



MOTOR DRIVEN—with 7 1/2 H.P. motor, 3 phase,
60 cy. 220-440 volts and controls. Machine is com-
plete as shown above. With air chuck and one collet.

GRINDERS, SURFACE

Abrasive 3B, 8 x 24", #33, #34 Vert
Brown & Sharpe #2, H.F.
Blanchard #16, 30" Mag. Chuck
Blanchard #10, 16" Chuck
G & L #45, 12" x 24" Hyd. Feed
G & L #5 Hyd. 10 x 36", #45, 12 x 24"
Heald 22—12" chuck, Arter 12"
Norton 6 x 18" Hyd.
Pratt & Whitney 12 x 36" Vert.
Reid #3, 11 x 36

LATHES

Hardinge Precision 9", 1" collet
Hendey 14" Yoke Head, M.D.
Lodge & Shipley #3 Duomatic, late
type (4)
Monarch 10 x 20" Model EE (2)
Monarch 12" x 30" CKK, Late (2)
Putnam 36" x 22"
Putnam 42" x 17", actual swing 56"
Reid Small Piece #9WSL, 18 x 22"
Sebastian 12" x 4" G.H.
Sundstrand Automatic Stub 8" & 15"
Wickes 32" x 35" G.H.

MILLS, PLAIN, UNIVERSAL & PROD.

Brown & Sharpe #000, 21
Burke #4 Plain, Vert. Attach.
Cinn. 08 Plain
Cincinnati #3 Hi-Power
Kent Owens, IV, IM
Sundstrand 00 & 0 Rigidmil
Van Norman 118 Prod. Hyd.
Van Norman #2SU Univ.

MILLS, VERTICAL

Brown & Sharpe #1, 3 SPD
Cincinnati 08
Cincinnati #2, 3 High Power
Cincinnati #4, High Power
Morey #12M Profiler, 2 sp. (3)
Pratt & Whitney 12B 25P. Profiler

PRESSES

304A Bliss S. S. 4" Str.
Bliss #645B, 650 Hi-Production
Presses
Bliss 18, 21 OBI, 58, 62, 162 OB.
Bliss 4 1/2 Double Action, Bullet, Roll
Feeds (2)
Bliss #78 1/2, 330 Ton
Bliss 3 1/2 Double Action Toggle, 407
Dbl. Crank D.A.
Ferracute EG54, 400 Ton Knuckle
Niagara A1 1/4, O.B.I.
Toledo 400 Ton Knuckle Joint #663
Toledo 29 Double Action Cam
V. & O. #102 O.B.I. Reducing

HYDRAULIC EQUIPMENT SELF CONTAINED PRESSES

600 Ton Williams & White 24" Up
Moving Ram 12" Str. 42" x 60"
Platen
500 Ton Shaft Straightener 24'
Long Bed. Watson Stillman
125 Ton Southwark Press, Bed 96"
x 30", 30" stroke, 2 to 4 ft. open-
ing
80 ton K. R. Wilson, self contained
Hyd. Press Platen size 51" x 24"
50 Ton Williams & White, 20" St.
54" x 20" Bed—24" opening

MISCELLANEOUS

300 Ton Watson Stillman 24 x 20"
Platen 11" St. 21" opening
All Hydraulic Equipment is completely
engineered and checked by a competent
staff, thus assuring reliability. Send us
your Hydraulic problems.

NEW IN STOCK—

Air Compressors—all sizes
Air Hydraulic Presses—Arbor
Presses #60 Famco—Band Saws
Kalamazoo—Drill Presses all sizes
—Hydraulic Press Northern 20 Ton
—Injection Molders, 1 ounce—
Fowler Presses, OBI, 1, 4 1/2, 5, 7 1/2,
10, 15, 20, 30 ton—Shaper, #2 Amco,
8" Shaperite—Shaper, Sheldon 12"
—Shears, Foot 22" to 8', 16 & 18
ga.—Shears, Power, 3' x 18 gauge
to 10' x 10 ga.—Welders, Arc,
Seam, Spot all sizes—Vert. Milling
Attach., Halco H.S.—Motors,
Grinders, Buffers, all sizes, etc.

TURRET LATHES

Denver 6.2, Shell Turret, G.H.
Acme 6W Fox Lathe
Brown & Sharpe, 2F, #10, 11, Hand-
screw
Gisholt #4 Univ. #5 Like New
Foster #1B, 2B
Hardinge E.S.M.
Morey #2G, Bar Feed
Oster 601 WD
Simmons #2 Micro-Speed
Warner & Swasey #2A, 1A
Warner & Swasey #2 Geared Head

MISCELLANEOUS

Automatics: 4 Sp. 1 1/2" Cone, B & S
00G, Cleveland Model B 1 1/16"
Band Saws: Marvel #8, Do All 36"
Zephyr
Dake Hyd. Arbor Presses
Dynamometer: Van Norman Grinders,
Valve Grinders, Crankshaft Grind-
ers
Filers—Do All Band Filer, Grob
Hacksaw: Peerless 6 x 6
Racine 12x24 Hyd
Honer: Micromatic #H-1
Keyseater: Davis, Baker, M & M
Microscope, Gaertner Toolmakers
Preheaters— for Plastic Moulding—
New & Used
Riveters: Hi Speed 1 1/2 B, 2AHD, 5A
Saws—Campbell Cutalator
Shaper: Rockford 24" Hyd, Late
Shaper—Brand New 7" Ammco, 8"
Shaperite
Shaper—Gould & Eberhardt 26",
American 24", Cincinnati 24"
Shaper—Queen City 24", Potter &
Johnston 24"
Tablet Machines—Stokes, Colton
Tappers: Bakewell #1, Haskins 3C
Welders—Ammunition Box, Taylor
Winfield—New
Welders, Seam & Spot: Thompson,
Taylor-Winfield



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RAILROAD EQUIPMENT—FOR SALE

STANDARD GAUGE FREIGHT CARS

Box, Single Sheathed, 50-Ton Capacity
Cabooses, Eight Wheel, Cupola Type
Flats, 50-Ton, Steel Underframe, 40' 0" long
Gondolas, Composite or All-Steel, 50-Ton & 70-Ton

Hoppers, Covered, All-Steel, 50-Ton & 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 8,000-Gallon, Class II

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

STANDARD GAUGE DUMP CARS

End Dump, 20-Yd., 50-Ton, Drop Door
End Dump, 10-Yd., 30-Ton, Lift Door

Side Dump, 16-Yd., 30-Ton, Lift Door
Side Dump, 20-Yd., 40-Ton, Lift Door

STANDARD GAUGE LOCOMOTIVES

Two Plymouth Diesel-Electric, 45-Ton, Standard Gauge, Type 0-4-4-0, Built 1942

Gasoline—10-Ton to 25-Ton

Gasoline-Electric—35-Ton

Diesel-Mechanical—8-Ton to 30-Ton

Propane-Electric—70-Ton

One Plymouth Model KC Flexomotive, 65-Ton, Standard Gauge, Type 0-6-0, Built 1940

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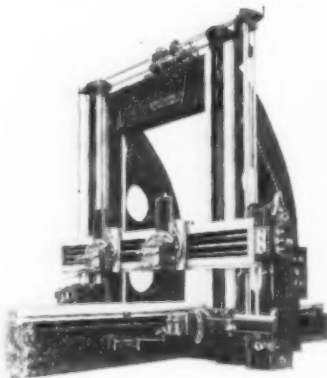
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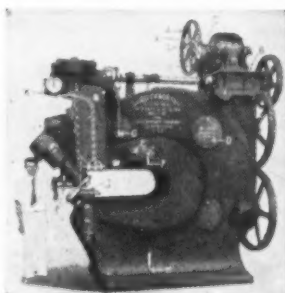
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Attach. for 330T G. & L. Mill & Outer Support
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GEAR SHAPER, No. 61 Fellows, 36'' capty., late
GEAR SHAPER, No. 61A Fellows, 1943
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GRINDER, Uni., 12'' x 36'' Thompson, M.D.
GRINDER, #16Y28 Bryant Int. 1943
GRINDER, No. 174 Head, exp. Int., 54'' Swing, 1942
GRINDER, No. 72A5 Head, 1943
GRINDER, No. 72A3 Head Int. Pl., 1942
GRINDER, No. 6-T Sellers Tool, 42
JIG BORER, No. 4, Knight, New 1935
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LATHE, 42'' x 31'' cen. Putnam, T. A. M. D.
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LATHE, 32'' x 25'' cen. Pittsburgh, 2 carr., 2 T.A., 43
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22"x10" Greaves-Klusman, cone, motorized
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23"x14" bed LeBlond Geared Head, m.d., taper
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24"x10" Greaves-Klusman Geared Head, m.d., taper
24"x10" Lodge & Shipley, cone
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No. 56-90 Cincinnati Duplex Hydromatic, m.d., latest
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#18 CINCINNATI Vertical Miller, 1941
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36" x 36" x 18" INGERSOLL Adjustable Rail Planer Type Miller, 40 HP AC motor drive, on rail head, two side heads
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Model H-1 MICROMATIC Hydrohoner
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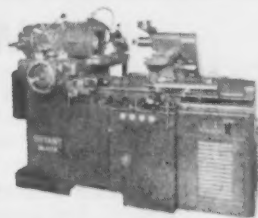
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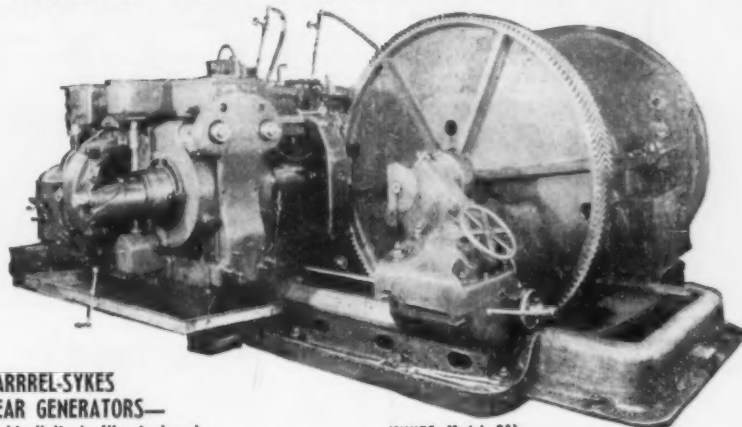
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Max. outside dia. of gear	49"	120"
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Max. face of straight tooth	10"	18"
Dia. of hole thru spindle	9 1/4"	18 1/2"

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WILLIAMS & WHITE NO. 29U BULLDOZER,

MOTOR DRIVEN

AJAX 1 1/2" UPSETTER

PRATT & WHITNEY 14" x 36" VERT. SURF.

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GARRISON 500 TON DOUBLE ACTION TOGGLE
DRAW PRESS

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SALE OR RENT

- 1—Owen Grapple size 86 Type RA
- 1—1/4 Lorain 41 Comb. S & D 1943
- 1—1/4 Northwest 25 Gas as Bhoec.
- 1—20 Ton Bay City Truck Crane 1943
- 2—10 Ton all steel Guy & Stiff Leg Derricks
- 2—6 Ton Huber 3W Rollers
- 1—45' Crane Boom for Link Belt LS90
- 1—35 Ton Plymouth Gas Loco. 1943
- 1—40 Ton Industrial Oil Fired Loco Crane 1943
- 1—65 Ton 0-6-0 Saddle Tank Loco 1943
- 2—Super C Tournapulls
- 6—50 Ton allsteel Gondolas
- 2—50 Ton Coal Hopper Cars

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1—40-36 LITTELL Motor Driven (220V-3P-60 Cy) Automatic Centering Reel. Coil Capacity 4000#. Maximum Width 36". Coil I.D. 20" to 24"—O.D. Max. 45". Price \$2,850.00 FOB Oaks, Pa.

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ELECTRIC FURNACE to 1850°

8 x 12 x 15 inside with Auto. Temperature Control 4.5 K.W. Sliding door, cheap to operate. Substantial. Dependable for Machine Shop—Tool Room. New. \$250.

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AIR COMPRESSORS
ELECTRIC—676, 1302, 1700, 2500, 3140 & 5000 FT.
DIESEL & GAS LOCOMOTIVES
12—25, 30, 45, 60, 80 & 100 TON
STEEL STORAGE TANKS
77—10,000, 15,000, 20,000 & 25,000 GAL. CAP.
B. C. STANHOPE, INC.
60 E. 42nd ST., N. Y. 17, N. Y.

THE CLEARING HOUSE

MOTORS—CRANES—M. G. SETS

In Stock—Immediate Shipment—Rebuilt and Guaranteed

OVERHEAD ELECTRIC TRAVELING CRANES			
Qu.	HP	Make	Span
1	10	Milwaukee	35'-0"
1	10	Shaw Box	40'-0"
1	10/3	Whiting	75'-0"

DIRECT CURRENT MOTORS			
Qu.	H.P.	Make	Type
1	3000	Whse.	Encl. (Rev.)
1	2400	Whse.	Encl. (Rev.)
1	1500	Whse.	Encl. (Rev.)
1	1200	Whse.	Encl. (Rev.)
1	800	Whse.	Encl. (Rev.)
1	350	G.E.	CD-160
1	325	Whse.	QM-660.6
1	300/350	El. Dy.	z 22
1	200	G.E.	MPC
1	200	Whse.	Mill
1	180	G.E.	MPC
1	150	C.W.	85-H
1	125	Whse.	8K-190
1	100/125	Rel.	1050-F
1	100	G.E.	MPC
1	90/100	Rel.	1050-F
1	50/75	Rel.	1050-F
1	35	G.E.	CD-125
1	35	G.E.	CD-147
1	25	Rel.	85P
1	23 1/2	Whse.	8K-150
1	20/75	Whse.	8K-151L
1	30	Al-Ch.	E-145
1	30	G.E.	CDM-105
2	27 1/2	El. Dy.	158
1	35	G.E.	RF-13
1	35	G.E.	CD-123
1	25	Whse.	8K-140
1	25	Whse.	8K-111L

Qu.	H.P.	Make	Type	R.P.M.
2	20	Al-Ch.	E-130	400/1200
3	20	G.E.	CD-123	500/1200

All above 230-VDC except where marked ***
 ***—Pedestal bearing mill design 525/600-VDC
 Rev.—Designed for mill reversing service
 *—T.E.F.C.

MOTOR GENERATOR SETS			
Qu.	K.W.	Make	Type
1	2400 (3U)	Al-Ch.	720 525
1	2400 (3U)	Whse.	720 525
1	1500	Whse.	514 525
2	1000	G.E.	514 575
1	500 (3U)	Whse.	1200 120/240
2	500	C.W.	720 575
1	500	C.W.	720 250/275
1	500	C.W.	720 250/275
1	200	Ridgway	900 250
1	155	G.E.	720 250
1	150	G.E.	1200 500
1	100	Ridgway	1200 275
1	85	C.W.	1200 250
1	75	Star	1200 250
1	75	Al-Ch.	900 250
1	50	Burke	1800 240
1	30	Reliance	1800 250
1	25	Whse.	1200 120/240
1	20	Reliance	1800 250

2025/2565 K.W. 225-V.D.C., G.E., 9000 Amp.,
 450-R.P.M., with booster.
 2760—K.V.A. Trans., 6000-V., 3-PH., 60-CY.,
 complete control, & C.D. distribution cubicles.
 Will Rewind Transformer to Suit Your Current.

SLIP RING MOTORS—CONSTANT DUTY			
Qu.	H.P.	Make	Type
1	3000	G.E.	MT
1	1200	C.W.	SR
2	1000	Al-Ch.	ANY

Qu.	H.P.	Make	Type	Volts	R.P.M.
1	600	G.E.	MT-20	2200	500
1	500	Whse.	C.W.	4000/2300	514
1	500	Al-Ch.	ANY	4000/2300	514
1	500	G.E.	MT-10-M	2200	514
2	400	G.E.	MT-412	2200	450
1	300	G.E.	I-15-M	2200	1500
1	300	Al-Ch.	ANY	2200	514
1	250	G.E.	MT-414	2200	500
1	250	G.E.	I-18-M	2200	585
1	150	G.E.	I-13-M	2200	1750
1	125	Whse.	CW-870	2200	870
1	100	F.M.	H20C	440/230	900
1	75	G.E.	IM	440/230	900
1	75	Whse.	CW-7540	440/230	900
1	60	Whse.	CW	440/230	900
1	50	G.E.	MT-538	2200	1150
1	50	Al-Ch.	ANY	440/230	900
1	40	Al-Ch.	ANY	2200/440	435

SYNCHRONOUS MOTORS			
Qu.	H.P.	Make	Type
1	3000	Whse.	80 4000/2400
1	700	G.E.	80 2200
1	600	Whse.	80 2400
1	400	Whse.	80 440
1	300	Whse.	80 440
1	268	Al-Ch.	100 2200
1	150	G.E.	100 2200
1	150	G.E.	100 550/2200
1	150	G.E.	550/2200
1	125	El. Mch.	100 4000/2400
1	125	G.E.	80 2200
1	100	Whse.	80 440/230
1	100	Whse.	100 2200
1	100	Ideal	80 220/440
1	100	G.E.	80 220/440
1	60	G.E.	80 220/440
1	50	G.E.	80 2300

T. B. MAC CABE COMPANY

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PHILADELPHIA 40, PENNA.

CABLE ADDRESS

"MACSTEEL" PHILADELPHIA, PA.

PHONE

DAVENPORT 4-8300

RE-NU-BILT Guaranteed

ELECTRIC POWER EQUIPMENT A.C. MOTORS

3 phase—60 cycle

SLIP RING			
Qu.	HP	Make	Type
1	1000	Whse.	CW
1	500	G.E.	IM
2	500	G.E.	M-574Y
1	500	G.E.	IM
1	500	G.E.	IP
1	350	G.E.	MT-442Y
1	300	Al-Ch.	2300
1	300	G.E.	IP
1	300	Al-Ch.	440/2200
1	250	A.C.	ANY
1	250	G.E.	M-5768-TEFC
1	250	G.E.	MT-424Y
1	250	G.E.	MT-5598
1	200	G.E.	MTP
4	125	G.E.	MT-566Y
2	100	G.E.	IM
3	100	A.C.	ANY
1	100	G.E.	MT-556
1	100	G.E.	IM-16

SQUIRREL CAGE			
Qu.	HP	Make	Type
2	650	G.E.	FT-559HY
2	450	Whse.	CR-1420
1	300	G.E.	KT-574Y
1	200	G.E.	IK-17
1	200	G.E.	IK
1	200	G.E.	KT-557
1	150	Whse.	CR-8568
3	125	Al-Ch.	ARW
1	125	G.E.	KF-6328-Z
1	125	Whse.	MS

SYNCHRONOUS			
Qu.	HP	Make	Type
2	3500	G.E.	TS
2	2000	Whse.	2300
1	900	Al-Ch.	2200
3	735	G.E.	ATI
2	350	G.E.	TS

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

FOR SALE

OVERHEAD CRANES

4—10 Ton Shaw, 67' Span, Cab, 230 DC.
 1—10 Ton Whiting Gantry, 55' Span, Cab, 3/60/440-AC
 1—7 1/2 Ton P & H, 72' Span, Cab, 230 DC.
 1—20 Ton P & H, 49' 3/4" Span, Cab, 3/60/220-AC.
 And 100 other Cranes of various sizes—
 Priced for quick Sale.

STEEL BUILDINGS

80 ft. x 120 ft. x 15'-6" to eaves, Clear Span, Structural only
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 147 ft. 8 in. x 146 ft. x 18 ft. to eaves, Clear Span, Complete.

TANKS

Cap. 1,600,000 Gallons, 95 ft. dia. x 30 ft.
 Cap. 252,300 Gallons, 38 ft. dia. x 29 ft.
 Also 8,000, 10,000, 12,000, 15,000, 400,000 Capacities.

Partial list—Send us your inquiries
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CRANE—E.O.T.

10-Ton Cleveland, 46' span, 18' lift, 3 motors, 110 V. DC., cab control, with Motor Generator Set included.
GALBREATH MACHINERY COMPANY
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OVERHEAD CRANES HOISTS & RUNWAYS

Available for immediate shipment over 100 cranes and hoists. All tonnages, spans and currents. Send me your inquiries.

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"Crane Specialist"

710 House Bldg., Pittsburgh 22, Pa.

FOR SALE OR RENT

Cleaver Brooks 60 HP Steam Generator.
 Oil Fired, 85# W.P.
 GE 400 Amp Arc Welders.

Industrial Brownhoist #5 Diesel Locomotive Crane 50' Boom 10 K.W. MG Set for Magnet Operation.

Krane Kar Model DYT Pneumatic Tires. 30' Boom. Capacity 10 Tons.

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MACHINES FOR YOUR YARD

We have for rent crawler cranes from 5 to 25 tons capacity, clamshell and dragline buckets, wrecking balls, and all other crane accessories.

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CRANES AND HOISTS

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ARNOLD HUGHES COMPANY

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 Woodward 1-1894

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USED—GUARANTEED

RAILROAD EQUIPMENT

65 ton 0-6-0 oil burner std. ga.
50 ton 0-6-0 Porter oil std. ga.
22 ton 0-4-0 Vulcan oil std. ga.
35 ton Davenport Diesel Mech. 36" ga.
20 ton Whitcomb Diesel Mech. 36" ga.
12 ton Plymouth gas 36" ga.
12 ton Plymouth gas std. ga.
8 ton Plymouth gas std. ga.
50 ton all steel twin hoppers
40 ton double sheathed Box Cars
50 ton Flat Cars 40'6"
50 ton Flat Cars 72'
20 yd. & 5 yd. Dump Cars

RAILS

60# Relaying Rail
75# Relaying Rail
70# Relaying Rail
100# Relaying Rail
Used Creosoted Ties
Used Tie Plates
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80D Shovel Fronts

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Car Repair Parts
For All Types of
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TANKS

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.125" x 14½" x 96"/120"

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25 ton Browning locomotive crane new 1942
30 ton Ind. Browhoist gas locomotive crane
70 ton Plymouth propane-elec. locomotive
3000 ft. Ing. Rand PRE compressors new 1942
400 KW General Motors diesel generator
3/60/2400
1000 KW G.E. Exc. Cond. Turbine generator
2300 V
25 ton Clyde stiffleg derrick with 125 HP
hoist new 1951

MISSISSIPPI VALLEY EQUIPMENT CO.

501 Locust St. St. Louis 1, Mo.

FOR SALE

Freight car repair parts
Relaying rails
Steel storage tanks
Freight cars and
Locomotives

Also

Contracting Equipment
Cranes—Tractors
Ditchers—Compressors
Diesel Engines
and Generating Sets

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Chicago 19, Illinois

EST. 1904

DAVIDSON PIPE COMPANY INC.

ONE OF THE LARGEST STOCKS IN THE EAST

Seamless and Welded ½" to 26" O.D.

All wall thickness Manufactured

Specialty large sizes.

Cutting — Threading — Flanging —
Fittings — Valves.

Call GEdney 9-6300

500 St. N. 2nd Ave., Buffalo 2, N. Y.

FOR SALE

Conveyorized Ajax-Hultgren Type H,
Salt Bath Heat Treating Furnace consist-
ing of separately controlled preheat,
high heat quench units. All transform-
ers, pyrometer controllers, etc., complete
for immediate installation. Equipment
in first class condition. Write:

Centrifugal Foundry Company
Muskegon, Michigan



PROMPT
DELIVERY
FROM STOCK

Mechanical Tubing ¼" to 14" O.D. •
Seamless Pipe to 24" O.D. • Boiler &
Pressure Tubes — Seamless or Welded
from ¾" • Stainless Steel Pipe, Tubing
& Fittings • Tube Fabrication, Bending,
Swaging, Upsetting, etc.

A B MURRAY CO. INC.

602 Green Lane Box 405-F
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FOR SALE

Locomotive Cranes—Diesel, Elec., Steam
Locomotives & Cars, Standard & narrow gauge
25 & 50 Ton Gantry Cranes, Electric
Cranes—Truck—Crawler—Gantry—Overhead
Bins and Tanks
1000 KW Diesel Elec. Portable Generator
1000 CFM Rotary Compressor Elec.

STONE THE CRANE MAN

1132 Prudential Bldg. Buffalo 2, N. Y.
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GREENPOINT IRON & PIPE CO. INC.
Sagart, Stagg & Meadow Sts. Brooklyn, N.Y.

LIFTING MAGNETS

A complete magnet service. Magnets, new &
rebuild, generators, controllers, reels, etc.
Magnet specialists since 1910

Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

THE CLEARING HOUSE

MOTORS—CRANES—M. G. SETS

In Stock—Immediate Shipment—Rebuilt and Guaranteed

OVERHEAD ELECTRIC TRAVELING CRANES				
Qu.	Span	Make	Current	
1	10	Milwaukee	230 VDC	
1	10	Shaw Box	230/440 VAC	
1	10/3	Whiting	230 VDC	

DIRECT CURRENT MOTORS				
Qu.	H.P.	Make	Type	R.P.M.
1	3000	Wase.	Encl. (Rev.)	600
1	2400	Wase.	Encl. (Rev.)	600
1	1500	Wase.	Encl. (Rev.)	600
1	1200	Wase.	Encl. (Rev.)	600
1	800	Wase.	Encl. (Rev.)	600
1	350	G.E.	CD-160	1150
1	325	Wase.	QM-660.6	450/900
1	200/250	El. Dy.	22	400/1200
1	200	G.E.	MPC	500/1200
1	200	Wase.	Mill	300/1200
1	300	Wase.		340/300
1	180	G.E.	MPC	400
2*	150	C.W.	83-H	890
1	125	Wase.	HK-190	600
1	100/125	Rel.	1095-F	300/1200
1	100	Rel.	1050-T	400/1200
1	90/160	G.E.	MPC	425/1125
1*	50/75	Rel.	1095-F	300/1200
1	35	G.E.	RF-14	500/1500
1	35	G.E.	CD-125	400/1200
1	35	G.E.	CD-147	300/1200
1	25	Rel.	85P	250/1000
1	23 1/2	Wase.	HK-150	400/1200
1	30/75	Wase.	HK-151L	400/1200
1	30	Al-Ch.	E-145	400/1200
1	30	G.E.	CDM-105	875/1750
2	27 1/2	KL Dy.	158	450/1350
1	25	G.E.	RF-13	400/1600
1	25	G.E.	CD-123	400/1200
1	25	Wase.	HK-140	400/1200
1	25	Wase.	HK-111L	250/1000

Qu.	H.P.	Make	Type	R.P.M.
2	20	Al-Ch.	E-130	400/1200
3	20	G.E.	CD-123	300/1200

All above 230-VDC except where marked ***
***—Pedestal bearing mill design 525/600-VDC
Rev.—Designed for mill reversing service
*—T.E.F.C.

ROTARY CONVERTERS

2025/2565 K.W. 225/285-V.D.C., G.E., 9000 Amp., 450-R.P.M., with booster.
2760—K.V.A. Trans. 6900-V., 3-PH., 60-CY., complete control, & C.D. distribution cubicles.
Will Rewind Transformer to Suit Your Current.

MOTOR GENERATOR SETS

Qu.	K.W.	Make	RPM	Volts DC	Volts AC
1	2450 (3U)	Al-Ch.	720	525	4800/2400
1	2400 (3U)	Wase.	720	600	4800/2400
1	1500	Wase.	514	250	4800/2300
2	1000	G.E.	514	575	4800/2300
1	500 (3U)	Wase.	1200	120/240	2300/440
2	500	C.W.	720	575	4000/2300
1	500	C.W.	720	250/275	4000/2300
1	500	C.W.	720	250/275	2300/440
1	200	Ridgway	900	250	2200
1	155	G.E.	720	250	2300/440
1	150	G.E.	1200	500	2300/440
1	100	Ridgway	1200	275	4000/2300
1	85	C.W.	1200	250	2200/440
1	75	Star	1200	250	440/220
1	75	Al-Ch.	900	250	3300
1	50	Burke	1800	240	440/220
1	80	Reliance	1800	250	440/220
1	25	Wase.	1200	120/240	440/220
1	20	Reliance	1800	250	440/220

34—3-Unit Set.

SLIP RING MOTORS—CONSTANT DUTY

Qu.	H.P.	Make	Type	Volts	R.P.M.
1**	3000	G.E.	MT	2200	358
1**	1200	C.W.	SR	2200	237
2**	1000	Al-Ch.	ANY	2200	235

Qu.	H.P.	Make	Type	Volts	R.P.M.
1**	600	G.E.	MT-20	2200	300
1	500	Wase.	C.W.	4000/2300	514
1	500	Al-Ch.	ANY	4000/2300	514
1	400	Al-Ch.	ANY	2200	514
2	500	G.E.	I-16-M	2200	450
2	400	G.E.	MT-413	2200	450
1	300	G.E.	I-15-M	2200	1500
1	300	Al-Ch.	ANY	2200	514
1	250	G.E.	MT-414	2200	300
1	200	G.E.	I-16-M	2200	585
1	150	G.E.	I-13-M	2200	1750
1***	125	Wase.	CW-870	2200	870
1	100	F.M.	H20C	440/230	900
1	75	G.E.	IM	440/230	900
1	75	Wase.	CW-7540	440/230	900
1	60	Wase.	CW	440/230	900
1	50	G.E.	MT-528	2200	1150
2	30	Al-Ch.	ANY	440/230	900
1	50	F.M.	HR	440/230	900
1	40	Al-Ch.	ANY	2200/440	435

**—Mill type pedestal bearing.
***—3-bearing.

SYNCHRONOUS MOTORS

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
1	3000	Wase.	80	4800/2400	720
1	700	G.E.	80	2200	720
1	600	Wase.	80	2400	720
1	400	Wase.	80	440	600
1	300	Wase.	80	440	514
1	288	Al-Ch.	100	2200	900
1	150	G.E.	100	2200	900
1	150	G.E.	100	550/2200	600
1	150	G.E.	80	550/2200	450
1	125	El. Mch.	100	4500/2400	900
1	125	G.E.	80	2200	900
2	100	Wase.	80	440/220	1800
1	100	Wase.	100	2200	1200
1	100	Ideal	80	220/440	900
1	100	G.E.	80	220/440	900
1	60	G.E.	80	220/440	1200
1	50	G.E.	80	2200	800

T. B. MAC CABE COMPANY

4302 CLARISSA STREET

PHILADELPHIA 40, PENNA.

CABLE ADDRESS

"MACSTEEL" PHILADELPHIA, PA.

PHONE

DAVENPORT 4-8300

RE-NU-BILT Guaranteed

ELECTRIC POWER EQUIPMENT

A.C. MOTORS

3 phase—60 cycle

Qu.	HP	Make	Type	Volts	Speed
1	1000	Wase.	CW	2300	444
1	500	G.E.	IM	440	900
2	500	G.E.	M-574Y	6600	900
1	500	G.E.	IM	2200	450
1	500	G.E.	IP	550	505
1	350	G.E.	MT-442Y	2200/4000	253
1	300	Al-Ch.	IP	2300	505
1	300	G.E.	IP	440/2300	705
1	300	Al-Ch.	IP	440/2200	705
1	250	A.C.	ANY	550	600
1	250 (NEW)	G.E.	MT-5768-TEFC	440	600
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	MT-5598	2200	1800
1	200	G.E.	MT-5598	440	1170
4	125	G.E.	MT-566Y	440/2200	435
2	100	G.E.	IM	410	600
5	100	A.C.	ANY	440	695
1	100	G.E.	MT-556	2200	865
1	100	G.E.	IM-16	2200	435

SQUIRREL CAGE

2	650	G.E.	FT-559RY	410	3570
2	450	Wase.	CR-1420	2300/4150	354
1	300	G.E.	KT-574Y	2300	505
1	200	G.E.	IK-17	440	580
1	200	G.E.	IK	440	865
1	200	G.E.	KT-557	440	1800
1	150	Wase.	CR-8568	440	880
3	125	Al-Ch.	ARW	2200	1750
1	125	G.E.	KF-6328-Z	440/2200	3585
1	125	Wase.	MS	440	485

SYNCHRONOUS

2	3500	G.E.	TS	2300	257
2	2000	Wase.		2300	120
1	900	Al-Ch.		2200	150
3	735	G.E.	ATT	2200/12000	600
2	350	G.E.	TS	2200	150

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

FOR SALE

OVERHEAD CRANES

4—10 Ton Shaw, 67' Span, Cab, 230 DC.
1—10 Ton Whiting Gantry, 55' Span, Cab, 3/60/440-AC
1—7 1/2 Ton P & H, 72' Span, Cab, 230 DC.
1—20 Ton P & H, 49'-3 1/2" Span, Cab, 3/60/220-AC.
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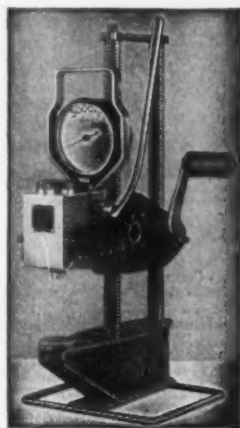
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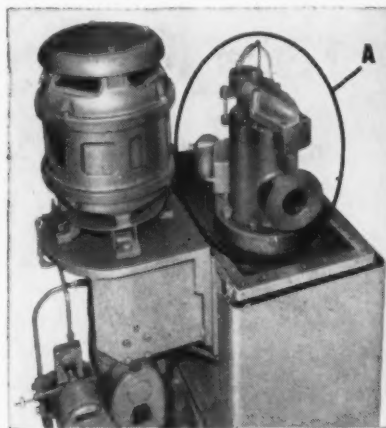
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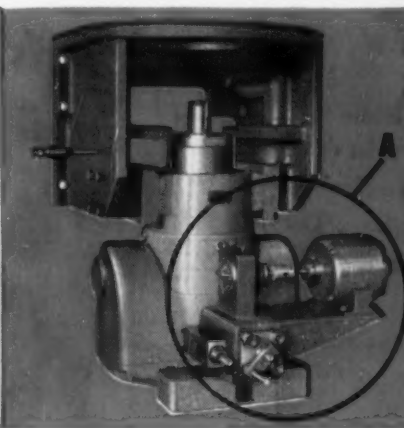
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